SEQUENCE LISTING

<110> Norris, Susan R
       Lincoln, Kim
       Abad, Mark Scott
       Eilers, Robert
       Hartsuyker, Karen Kindle
       Hirshberg, Joseph
       Karunanandaa, Balasulojini
       Moshiri, Farhad
       Stein, Joshua C.
       Valentin, Henry E.
       Venkatesh, Tyamagondlu V.

<120> Tocopherol biosynthesis related genes and used thereof

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<150> us 60/400,689
<151> 2002-08-05

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<170> PatentIn version 3.2

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Leu Ile Ser Ser Pro Cys Phe Ile Gly Leu Thr Gly Met Gly Ser Ala
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Thr Gln Leu Arg Ala Arg Arg Ser Leu Ile Ser Ser Ala Val Ala Thr
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Asn Ser Leu Leu His Asp Val Gly Ala Thr Val Ala Val Leu Gly Gly
65                  70                  75                  80


Ala Tyr Ala Leu Val Leu Ser Phe Glu Ser Leu Thr Lys Arg Asn Val
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Ile Gln Gln Ser Leu Ser Arg Lys Leu Val His Ile Leu Ser Gly Leu
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Leu Phe Val Leu Ala Trp Pro Ile Phe Ser Gly Ser Thr Glu Ala Arg
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Tyr Phe Ala Ala Phe Val Pro Leu Val Asn Gly Leu Arg Leu Val Ile
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Ser Ser Ser Arg Phe Pro Ala Thr Lys Ile Arg Lys Ser Ser Leu Ala
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Ala Val Met Phe Pro Glu Asn Ser Val Leu Ser Asp Val Cys Ala Phe
65   70   75   80

Gly Val Thr Ser Ile Val Ala Phe Ser Cys Leu Gly Phe Trp Gly Glu
                85   90   95

Ile Gly Lys Arg Gly Ile Phe Asp Gln Lys Leu Ile Arg Lys Leu Val
            100   105   110

His Ile Asn Ile Gly Leu Val Phe Met Leu Cys Trp Pro Leu Phe Ser
            115   120   125

Ser Gly Ile Gln Gly Ala Leu Phe Ala Ser Leu Val Pro Gly Leu Asn
    130   135   140

Ile Val Arg Met Leu Leu Leu Gly Leu Gly Val Tyr His Asp Glu Gly
145   150   155   160

Thr Ile Lys Ser Met Ser Arg His Gly Asp Arg Arg Glu Leu Leu Lys
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Gly Pro Leu Tyr Tyr Val Leu Ser Ile Thr Ser Ala Cys Ile Tyr Tyr
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Trp Lys Ser Ser Pro Ile Ala Ile Ala Val Ile Cys Asn Leu Cys Ala
        195   200   205

Gly Asp Gly Met Ala Asp Ile Val Gly Arg Arg Phe Gly Thr Glu Lys
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gaagcgtatc agtggttcct ggagcagatt caggtctggg gtgcgcgtct gcatcgtatc    720

agcgctgttg agcatgacca gaacatggca ttcattcagg cgctgcgtca ctttgctacc    780

ttcgcttatg gtctgcattt agccgaagag aacgtcaatc tggatcagct gctggcgctc    840

tcgtcgccca tttaccggct tgaactggcg atggtggggc ggttgttcgc tcaggatccg    900

caactctatg cggatatcat catgtcttca gagagtaatc tggcgctgat aaaacgctat    960

taccagcggt ttggtgaagc gattgcgctg ctggagcagg gcgacaagca ggcgtttatc   1020

gccagcttta accgggttga acagtggttt ggcgatcacg caaaacgctt cctggtcgaa   1080

agccgaagcc tgttgcgatc ggccaatgac agccgcccat aa                      1122
```

<210> 17
<211> 702
<212> DNA
<213> Synechocystis PCC6803

<400> 17
```
atgggcattg agcaaaataa tcctatggct ttgcccctct ggattgcggt ggggctggcg     60

gcgacctacc taggggctgt ggtgttaacc gcggaactgc ttaaccgcct ttccctcagt    120

ccggcggagg taactcgtaa aattgtccac atcggagcgg ggcaagtggt gctgattgct    180

tggtggttga gtattcctgg ttgggtgggg cgatcgccg gggttttgc cgctggcatt     240

gcagtgctct cctatcgttt gccgattttg cccagcttag aaagtgttgg ccgccacagt    300

tacggcactt tgttttacgc ccttagcatt ggtctattgg tggggggatt tttctccctt    360

ggactgccga tatttgcggc gatcggtatt ttagtcatgg cctggggcga tggactggcg    420

gccctggtgg acaaaggtg ggggcgtcac cgctaccaag tctttggttt ccgcaaaagt    480

tgggagggca ctctcaccat ggtgttggcc agttttttgg tcacggttgt atttcttagt    540

tacaccttcg gcttcacagt tattgtcctt gttgtggctg ggacggtggc gatcgccagt    600

gctggactgg agagctttc ccgctggggc attgataact taactgttcc cctgggcagt    660

gctttgattg cttgggctgg tagctatctt tggttgggat ag                      702
```

<210> 18
<211> 1188
<212> DNA
<213> Synechocystis PCC6803

<400> 18
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gatacataaa tcttcaacac aactctttaa ttatctagtt taatacaaat ggcggcgata     60

gaggacagtc caacgttttc ctctgtggta actccggcgg cttttgagat aggcagcctc    120

ccgacaaccg agataccggt ggatccggtg gaaaatgatt caacagcacc gccaaaaccg    180

gtgagaatca cctgtccaac agtcgccgga acttatcccg tcgttttatt cttccatggc    240

ttttatcttc gcaactactt ctactctgac gttcttaacc acatcgcttc gcatggttac    300

attcttgtag ccccacagtt gtgcaaatta ttgccgccgg gagggcaagt ggaagtggac    360

gatgctggaa gtgtgataaa ctgggcatcg gaaaacctca aagctcacct accaacttcg    420
```

```
gtaaatgcta atggaaaata caccctcactc gtgggccaca gccgcggtgg gaaaacggcg    480

tttgcggttg cgctaggcca tgccgcaaca ttagacccat ccatcacgtt ttcagctcta    540

ataggaattg atccagtcgc aggaactaac aaatacatta gaaccgatcc gcatatctta    600

acgtataaac cggaatcttt cgagctggac ataccggttg cagtggtggg aaccggactc    660

ggaccgaagt ggaacaacgt gatgccacca tgcgcaccaa cggacttaaa ccatgaggag    720

ttttacaaag agtgtaaggc gacgaaagcc catttcgtgg ctgcggatta cggacatatg    780

gatatgttgg acgatgattt gcccggtttt gttgggttta tggccggttg tatgtgtaag    840

aatgggcaaa gaaaaaagtc tgagatgagg agctttgtag gtggaattgt ggttgcgttt    900

ctcaagtata gtttgtgggg tgaaaaagcg gagattcgat tgattgtgaa ggatccttcc    960

gtttctccgg ccaagcttga tccttcacct gagttggaag aagcttctgg tatcttcgtc   1020

tagatttgtg ttatgtacta ttatcagagg ggtcttgaat atttgaaaaa cctatcaatg   1080

ttttctagct ccaagctagc tattgttcat gtcctaagtt gcatgtgtat tttttattaaa  1140

ctcgatcaaa acatttgtta tagtttttacc ccaaaaaaaa aaaaaaaa              1188
```

<210> 19
<211> 1135
<212> DNA
<213> Arabidopsis thaliana

<400> 19
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aaaaaaagta aagaaaagaa aaactaataa agaacaaaaa aaatgtcctc ttcttcatca     60

agaaacgcct ttgaagatgg caaatacaaa tcaaatctct taaccttgga ctcatcatct    120

cgttgctgca aaataacacc gtcttctaga gcttcaccgt ctccgccaaa gcagctgttg    180

gtggctacgc cggtggagga aggagattat ccggtggtga tgctcctcca tggttacctt    240

ctctacaact ccttctattc tcagcttatg ttgcatgtct cttctcatgg cttcatcctc    300

atcgctcctc agttatatag tatcgccgga ccagacacaa tggatgagat aaaatcaacg    360

gcggagatta tggattggtt atcagtagga cttaatcact ttcttccagc gcaagtaaca    420

ccaaacctat ccaaatttgc cctctccggc catagccgcg gtggcaaaac cgcgtttgcg    480

gtcgccttaa agaaatttgg gtactcctcg aatctaaaga tctcgacatt gatcggtata    540

gatccagtcg atggaacagg gaaagggaaa caaacccctc ctccggtgtt ggcttacctt    600

ccaaactcat ttgacctaga caaaacgcct atacttgtga tcggttcggg gcttggtgaa    660

accgctcgga acccattatt cccaccgtgt gcacctcccg gagtgaatca ccgagagttc    720

tttcgggaat gtcaaggtcc agcatggcat ttcgttgcga aggattatgg gcatttggac    780

atgcttgatg atgatacaaa agggattaga gggaagagtt cttattgttt gtgtaagaat    840

ggtgaagaga ggagaccaat gaggagattc gttggtggac ttgttgtatc attttttgaag   900

gcttatttgg aaggagatga tcgtgaatta gttaagatca aagatgggtg tcacgaggat    960

gttcccgttg aaattcaaga gtttgaggtt atcatgtaaa cataagtttt tctttagggg   1020

ctggtttttc tattgtcaat atcatcagct tttgttgctt atggttttac aaacttatat   1080
```

tgtacaactc tttaagtcac ctctttgctt acaaaaaaaa aaaaaaaaaa aaaaa   1135

<210> 20
<211> 190
<212> PRT
<213> Aquifex aeolicus

<400> 20

Met Asn Leu Glu Arg Gly Asn Met Leu Glu Leu Arg Arg Lys Leu Phe
1   5   10   15

His Phe Leu Ser Ile Leu Leu Leu Ile Ile Pro Val Lys Phe Phe Pro
            20   25   30

Phe Trp Leu Asn Val Phe Leu Phe Leu Ser Ala Ile Leu Leu Asn Leu
            35   40   45

Leu Ile Ile Phe Arg Val Ser Pro Phe Tyr Asn Ile Phe Glu Val Phe
    50   55   60

Ile Lys Leu Phe Glu Arg Glu Lys Asn Leu Glu Thr Pro Gly Ile Gln
65   70   75   80

Ser Leu Trp Ala Ile Leu Gly Val Phe Ile Ser Tyr Leu Leu Phe Gly
                85   90   95

Glu Asn Ala Val Val Gly Ile Val Val Leu Ala Leu Gly Asp Gly Phe
            100   105   110

Ser Gly Leu Val Gly Tyr Tyr Phe Gly Arg Arg Lys Leu Phe Tyr Asn
            115   120   125

Pro Lys Lys Ser Leu Glu Gly Thr Leu Ala Phe Phe Thr Ala Ser Phe
        130   135   140

Leu Gly Leu Leu Leu Phe Thr Asp Phe Cys Glu Ala Phe Val Ile Ser
145   150   155   160

Leu Ile Cys Ala Val Leu Glu Ser Leu Pro Leu Lys Leu Asp Asp Asn
                165   170   175

Phe Tyr Ile Pro Val Leu Ala Ser Phe Leu Gly Glu Val Leu
            180   185   190

<210> 21
<211> 237
<212> PRT
<213> Chlorobium tepidum

<400> 21

Met Thr Ala Ile Ala Pro Thr Phe Phe Asp Leu Pro Val Val Trp His
1   5   10   15

```
Asn Val Leu Val Met Leu Leu Thr Ile Ala Tyr Val Phe Ser Val Pro
         20              25              30

Leu Leu Met Asp Trp Leu Val Thr Asn His Gly Leu Pro Arg Asp Ile
         35              40              45

Ser Arg Lys Ile Thr His Ile Cys Ala Gly Ser Val Ile Val Phe Leu
    50              55              60

Pro Leu Phe Arg Asp Gly Asp Trp Ser His Tyr Leu Asn Ile Thr Val
65              70              75              80

Phe Ala Val Trp Thr Val Leu Leu Ile Gln Lys Gly Leu Phe Ala Ala
             85              90              95

Asp Asp Asp Gln Ala Val Lys Thr Met Thr Arg Thr Gly Asp Lys Arg
         100             105             110

Glu Leu Leu Lys Gly Pro Leu Tyr Phe Val Ile Val Ala Met Ile Cys
         115             120             125

Gly Thr Leu Tyr Tyr Lys Gln Phe Ala Gly Val Leu Ala Met Ala Ile
    130             135             140

Leu Gly Trp Gly Asp Gly Leu Ala Pro Ile Val Gly Thr Arg Met Gly
145             150             155             160

Lys Met Lys Tyr Lys Val Phe Cys Glu Arg Ser Val Glu Gly Ser Ile
             165             170             175

Ala Phe Leu Ala Gly Ser Leu Ala Ala Gly Leu Phe Phe Val Trp Leu
         180             185             190

Ile Val Pro Gln Ala Phe Asn Pro Ala Lys Ile Ala Met Ile Ala Val
         195             200             205

Ala Ala Thr Val Ile Glu Ala Leu Ser Pro Lys Glu Val Asp Asn Ile
    210             215             220

Leu Ile Pro Ala Glu Val Ile Ala Leu Ala Ala Val Leu
225                 230             235
```

```
<210>   22
<211>   477
<212>   PRT
<213>   Chlorobium tepidum

<400>   22
```

```
Met Gly Val Val Met Phe Phe Ile Pro Ser Tyr Phe Ser Ser Asn Phe
1               5               10              15
```

Tyr Pro Leu Ala Ala Ala Phe Leu Phe Ala Val Val Gly Leu Val Ser
            20   25   30

Leu Lys Ala Gly Ile Leu Gln Ser Leu His Gly Glu Pro Val Val Thr
        35   40   45

Gln Glu Gly Glu Arg Val Ile Ser Tyr Gly Pro Val Leu Phe Pro Leu
    50   55   60

Val Phe Phe Leu Gln Ala Leu Phe Leu Trp Gly Glu His Val Trp Ile
65   70   75   80

Leu Gln Ile Ser Met Leu Val Leu Gly Ile Gly Asp Ala Leu Ala Ala
                85   90   95

Leu Val Gly Thr Ala Ala Gly Gly Arg His Ile Glu Asn Leu Thr Lys
            100   105   110

Ser Arg Lys Ser Ile Glu Gly Ser Met Ala Met Phe Ile Ser Ser Leu
        115   120   125

Val Ile Leu Ser Val Ser Ile Phe Val Phe Arg Asp Ala Phe Thr Gly
    130   135   140

Gly Leu Val Gly Gln Pro Ile Trp Lys Leu Leu Ala Leu Ala Leu Leu
145   150   155   160

Leu Ala Leu Leu Val Thr Ala Val Glu Ala Leu Leu Ser Trp Gly Leu
            165   170   175

Asp Asn Leu Phe Ile Pro Leu Ala Ile Ala Tyr Val Leu Tyr Val Val
            180   185   190

Asp Val Asn Ser Met Val Thr Ile Asp Gly Leu Leu Leu Gly Gly Leu
        195   200   205

Phe Ala Leu Phe Ile Ala Ile Phe Ser Ile Lys Val Lys Phe Leu Asn
    210   215   220

Asn Ser Gly Ala Thr Ala Thr Phe Leu Leu Gly Thr Thr Ile Phe Gly
225   230   235   240

Val Gly Gly Met Val Trp Thr Val Pro Met Leu Thr Phe Tyr Leu Leu
            245   250   255

Ser Ser Ile Leu Ser Lys Leu Gly His Lys Arg Lys Ala Lys Phe Asp
            260   265   270

Leu Val Phe Glu Lys Gly Ser Gln Arg Asp Ala Gly Gln Val Tyr Ala
            275   280   285

```
Asn Gly Gly Val Ala Trp Ile Met Met Val Ile Tyr Ser Leu Thr Gly
    290                 295                 300

Asp Pro Tyr Ile Phe Phe Ala Tyr Leu Gly Thr Leu Ala Ala Val Gln
305                 310                 315                 320

Ala Asp Thr Trp Ala Thr Glu Ile Gly Thr Met Trp Pro Asn Ala Lys
            325                 330                 335

Ala Arg Leu Ile Thr Thr Phe Lys Asp Val Pro Val Gly Thr Ser Gly
            340                 345                 350

Gly Val Ser Ile Pro Gly Thr Leu Ala Ser Phe Leu Gly Ser Leu Leu
        355                 360                 365

Ile Cys Ser Ser Ala Val Leu Met Asn Val Ser Trp Ile Asp Gln Val
    370                 375                 380

Gly Ile Val Thr Ser Leu Leu Val Ile Gly Val Ser Gly Leu Phe Ala
385                 390                 395                 400

Ser Leu Val Asp Ser Phe Phe Gly Ala Thr Val Gln Ala Gln Tyr Tyr
            405                 410                 415

Asp Pro Ile Arg Gln Lys Val Thr Glu Arg Thr His Ser Ile Ala Ser
            420                 425                 430

Asp Gly Ser Arg Val Ala Asn Glu Leu Leu Lys Gly Tyr Asp Phe Val
        435                 440                 445

Asn Asn Asp Leu Val Asn Thr Leu Cys Ala Ile Ser Gly Ser Ala Val
    450                 455                 460

Ala Tyr Leu Val Val Arg Asn Leu Val Ser Leu Ser Leu
465                 470                 475
```

```
<210>  23
<211>  236
<212>  PRT
<213>  Chloroflexus aurantiacus

<400>  23
```

```
Met Ser Thr Arg Asp Leu Ile Gly Leu Ile Val Ser Phe Gly Tyr Ala
1               5                   10                  15

Phe Gly Leu Leu Ile Ile Ala Glu Val Ile Arg Arg Trp Arg Gly Tyr
            20                  25                  30

Pro Gln Asp Phe Thr Arg Lys Phe Val His Ile Gly Ala Gly Met Trp
        35                  40                  45
```

Val Phe Gly Val Leu Ala Leu Phe Glu Asn Trp Thr Ile Gly Ile Ile
50   55   60

Pro Phe Ala Thr Phe Ile Val Leu Asn Phe Ile Phe Tyr Arg Phe Arg
65   70   75   80

Leu Leu Ala Ala Ile Asp Ala Pro Asp Ser Thr Pro Gly Thr Val Tyr
                    85   90   95

Phe Ala Leu Ser Ile Thr Ile Leu Phe Leu Ile Phe Trp Arg Thr Asn
                    100   105   110

Ser Pro Asp Asp Arg Gly Tyr Ile Ala Ala Ala Gly Thr Met Ala Met
                    115   120   125

Thr Trp Gly Asp Ala Leu Ala Ala Ile Val Gly Lys Arg Trp Gly Arg
                    130   135   140

His Tyr Tyr Gln Ile Gly Gln Gly Arg Arg Ser Phe Glu Gly Ser Ala
145   150   155   160

Ala Met Phe Ile Ala Ser Thr Val Ala Ile Leu Leu Thr Leu Leu Phe
                    165   170   175

Thr Pro Gly Ser Ala Leu Ser Pro Gln Ser Ser Pro Ile Asp Val Gly
                    180   185   190

Ala Ala Leu Ile Thr Ser Ile Val Ala Gly Leu Val Ala Thr Ile Ala
                    195   200   205

Glu Gly Val Ser Pro His Gly Thr Asp Asn Ile Ser Val Pro Leu Leu
210   215   220

Ala Gly Ala Val Ile Ala Val Met Leu Gly Val Val
225   230   235

<210> 24
<211> 209
<212> PRT
<213> Nostoc punctiforme

<400> 24

Met Leu Leu Ile Leu Val Ile Ala Trp Val Val Asn Arg Phe Ala Asp
1   5   10   15

Glu Pro Glu Ile Val Arg Lys Ile Val His Ile Gly Thr Gly Asn Val
                    20   25   30

Ile Leu Leu Ala Trp Trp Leu Asp Ile Pro Ala Ser Val Gly Ile Thr
                    35   40   45

Ala Ser Ile Leu Ala Ser Ala Ile Thr Leu Leu Ser Tyr Arg Leu Pro

                50   55   60

Ile Leu Pro Gly Ile Asn Ser Val Gly Arg Gln Ser Phe Gly Thr Phe
65   70   75   80

Phe Tyr Ser Val Ser Phe Gly Ile Leu Val Ala Ser Phe Trp Tyr Leu
                85   90   95

Gln Gln Pro Gln Tyr Ala Ala Leu Gly Ile Leu Ile Met Thr Trp Gly
                100   105   110

Asp Gly Leu Ala Ala Leu Ile Gly Gln Arg Phe Gly Thr His Lys Tyr
            115   120   125

Lys Val Phe Gly Thr Gln Lys Ser Trp Glu Gly Ser Leu Thr Met Met
            130   135   140

Phe Val Ser Tyr Phe Ile Ser Ile Leu Ile Leu Val Gly Thr Gln Gly
145   150   155   160

Asn Ser Trp Gln Thr Trp Val Ile Ser Leu Ala Val Ala Phe Ile Ala
                165   170   175

Thr Val Leu Glu Ala Phe Ser Phe Leu Gly Ile Asp Asn Leu Thr Val
                180   185   190

Pro Leu Gly Ser Ala Ala Leu Ala Phe Phe Leu Ser Gln Leu Val Tyr
            195   200   205

Phe

<210> 25
<211> 239
<212> PRT
<213> Nostoc punctiforme

<400> 25

Met Thr Asn Asp Phe Ile Gly Leu Ala Ile Ser Tyr Ile Tyr Ala Ile
1   5   10   15

Ser Leu Leu Val Ile Gly Glu Gly Leu Arg Arg Leu Phe Gly Val Lys
                20   25   30

Pro Asp Leu Thr Arg Lys Ala Ile His Ile Gly Ala Gly Met Trp Val
            35   40   45

Phe Gly Val Leu Leu Leu Phe Asn Arg Trp Glu Ile Gly Ile Ile Pro
        50   55   60

Phe Ala Thr Phe Ile Gly Leu Asn Tyr Leu Phe Tyr Arg Tyr Arg Phe
65   70   75   80

Ile Gly Ala Met Asp Thr Gln Asp Ser Ser Pro Gly Thr Val Tyr Phe
                85   90   95

Ala Ile Ser Val Thr Leu Leu Phe Gly Leu Leu Trp Arg Pro Asp Gly
            100   105   110

Pro Val Asp Ser Val Ala Ile Ala Val Ala Gly Ile Met Ala Met Thr
            115   120   125

Trp Gly Asp Ala Leu Ala Ala Leu Ile Gly Arg Arg Phe Gly Gln His
        130   135   140

Lys Tyr Gln Val Gly Asn Ser Val Arg Ser Trp Glu Gly Ser Ala Ala
145   150   155   160

Met Phe Val Ala Ser Thr Val Val Ile Phe Leu Val Leu Leu Leu Leu
            165   170   175

Pro Gly Ser Ser Leu Ser Pro Leu Gly Thr Pro Leu Ser Phe Gly Leu
            180   185   190

Ala Leu Leu Thr Ala Val Val Ala Ala Thr Phe Ala Thr Leu Ala Glu
            195   200   205

Ala Val Ser Pro His Gly Thr Asp Asn Leu Ser Val Pro Leu Val Thr
    210   215   220

Ala Gly Val Val Trp Val Ile Lys Gln Asn Leu His Leu Phe Phe
225   230   235

<210> 26
<211> 235
<212> PRT
<213> Nostoc sp.-pcc 7120

<400> 26

Met Leu Asn Leu Val Ser Glu Leu Ile Ser Thr Pro Pro Leu Trp Leu
1   5   10   15

Gln Ile Thr Ile Val Ala Ala Trp Val Phe Phe Ile Leu Ala Ile Ala
            20   25   30

Gly Leu Val Asn Arg Phe Ala Thr Ser Asp Ser Glu Ile Val Arg Lys
        35   40   45

Ile Val His Ile Gly Ala Gly His Val Ile Leu Leu Ala Trp Trp Leu
    50   55   60

Asp Ile Pro Ala Ser Val Gly Ile Gly Ala Ser Val Val Ala Ser Ile
65   70   75   80

```
Val Thr Leu Leu Ser Tyr Ile Phe Pro Leu Leu Pro Gly Ile Asn Ser
            85              90              95
```

```
Val Gly Arg Gln Ser Leu Gly Thr Phe Phe Tyr Ala Val Ser Val Gly
            100             105             110
```

```
Ile Leu Val Ala Trp Phe Trp His Ile Gln Gln Pro Gln Tyr Ala Ala
            115             120             125
```

```
Ile Gly Met Met Val Met Ala Trp Gly Asp Gly Leu Ala Ala Leu Val
            130             135             140
```

```
Gly Gln Arg Phe Gly Lys His Lys Tyr Lys Leu Leu Gly Ala Gln Lys
145             150             155             160
```

```
Ser Trp Glu Gly Ser Leu Thr Met Ala Leu Ala Ser Tyr Leu Val Cys
            165             170             175
```

```
Ser Leu Ile Leu Leu Gly Val Leu Gly Asn Val Trp Gln Thr Trp Leu
            180             185             190
```

```
Val Ser Leu Ala Val Ala Phe Val Ala Thr Ser Leu Glu Ala Phe Ser
            195             200             205
```

```
Leu Leu Gly Val Asp Asn Leu Thr Val Pro Leu Gly Ser Ala Ala Ile
    210             215             220
```

```
Ala Phe Ala Leu Ile Gln Phe Trp Pro Leu His
225             230             235
```

```
<210>   27
<211>   201
<212>   PRT
<213>   Prochlorococcus marinus-MIT9313

<400>   27
```

```
Met Leu Ser Ala Ala Val Val Cys Arg Val Arg Trp Pro Asn Gln Arg
1               5               10              15
```

```
Glu Leu Ser Arg Lys Ile Val His Ile Gly Thr Gly Pro Val Ile Pro
            20              25              30
```

```
Leu Ala Trp Trp Leu Gly Ile Pro Ser Asp Trp Ala Ile Pro Met Ala
            35              40              45
```

```
Ile Leu Ile Thr Ile Gly Ile Leu Ile Asn His Arg Trp Arg Leu Leu
    50              55              60
```

```
Pro Ala Ile Glu Asp Val Asn Arg His Ser Tyr Gly Thr Val Ala Tyr
65              70              75              80
```

```
Ala Leu Thr Ile Thr Leu Leu Leu Ile Phe Phe Trp Pro Glu Asn Ala
            85                  90                  95

Ala Ala Val Cys Ser Gly Val Leu Val Met Ala Phe Gly Asp Gly Leu
            100                 105                 110

Ala Gly Leu Ile Gly Arg Lys Val Arg Ser Pro Asn Trp Leu Ile Trp
            115                 120                 125

Gly Gln Arg Lys Ser Ile Ala Gly Thr Leu Thr Met Ala Val Ile Thr
            130                 135                 140

Leu Ile Ile Leu Phe Thr Leu Ser Leu Leu Ile Asp Ala Ser Phe His
145                 150                 155                 160

Pro Leu Arg Ile Phe Ala Val Thr Gly Leu Ala Val Gly Leu Glu Gln
                165                 170                 175

Leu Ser Arg Trp Gly Ile Asp Asn Leu Thr Val Pro Ile Gly Val Ala
            180                 185                 190

Val Ala Trp Ser Trp Met Thr Ala Ile
            195                 200
```

```
<210>   28
<211>   217
<212>   PRT
<213>   Prochlorococcus marinus-CCMP-1375

<400>   28
```

```
Met Ile Asn Ala Tyr Ser Phe Ile Leu Ile Ser Gly Trp Leu Ile Ile
1               5                   10                  15

Val Leu Ser Thr Ser Tyr Phe Cys Asn Lys Leu Phe Pro Glu Glu Lys
            20                  25                  30

Glu Leu Ser Arg Lys Ile Val His Met Gly Ser Gly Pro Ile Ile Pro
            35                  40                  45

Leu Ala Tyr Trp Leu Asn Ile Ser Ala Gln Ile Ala Ile Pro Ile Ala
    50                  55                  60

Ser Val Ile Thr Leu Ala Leu Leu Ile Asn Tyr Arg Phe Lys Leu Leu
65                  70                  75                  80

Thr Ser Ile Glu Asn Ile Glu Arg Lys Ser Phe Gly Thr Ile Ala Tyr
            85                  90                  95

Gly Ile Ser Ile Thr Leu Leu Leu Ile Leu Phe Trp Thr Asp Asn Pro
            100                 105                 110

Ser Ala Val Ile Ser Gly Val Leu Val Met Ala Phe Gly Asp Gly Leu
                        Page 21
```

```
             115                    120                    125

Ala Gly Phe Ile Gly Arg Lys Val Lys Ser Pro Gln Trp Ile Leu Phe
    130                 135             140

Gly Gln Arg Lys Ser Leu Ile Gly Thr Leu Thr Met Gly Phe Val Ser
145                 150                 155                 160

Ala Leu Ile Leu Thr Ile Val Asn Gln Ser Thr Ala Met Gln Leu Gly
                165                 170                 175

Pro Ile Ala Ile Leu Ser Ile Thr Ser Ile Ala Val Ala Leu Glu Gln
            180                 185                 190

Val Ser Thr Leu Gly Ile Asp Asn Ile Thr Val Pro Ile Gly Val Ala
            195                 200                 205

Leu Ser Trp Gln Ile Met Ser Phe Arg
    210                 215
```

```
<210>  29
<211>  204
<212>  PRT
<213>  Rickettsia conorii

<400>  29
```

```
Met Glu Ile Lys Asp Phe Asp Phe Glu Lys Lys Arg Lys Ile Phe His
1               5                   10                  15

Leu Ser Ala Ile Ile Phe Pro Leu Leu Tyr Leu Phe Ile Pro Arg Thr
                20                  25                  30

Ala Met Thr Leu Leu Leu Phe Ile Ile Thr Ala Ile Thr Leu Tyr Leu
            35                  40                  45

Asp Val Ser Arg His Asn Asn Ala Thr Ile Ser Glu Phe Val Thr Arg
    50                  55                  60

Phe Phe Ser Lys Val Ile Arg Leu Glu Glu Asn Asn Gly Ser Phe Ala
65                  70                  75                  80

Leu Ser Gly Val Ser Phe Met Met Ile Gly Phe Phe Leu Thr Ala Leu
                85                  90                  95

Leu Phe Pro Lys Asn Leu Val Ile Cys Ser Trp Leu Ile Leu Ile Ile
            100                 105                 110

Ser Asp Cys Leu Ala Ala Leu Val Gly Val Lys Ile Gly Asn Ser Leu
            115                 120                 125

Gly Asn Gly Lys Ser Ile Ala Gly Ser Ile Thr Phe Leu Ala Ser Ala
    130                 135                 140
```

Ile Phe Ile Ser Ile Leu Val Tyr Phe Tyr Leu Gly Tyr Asn Thr Ser
145   150   155   160

Phe Ile Ile Ile Ile Ile Ser Cys Ile Gly Ala Thr Val Ala Glu Phe
                165   170   175

Tyr Ser Lys Asp Leu Arg Ile Asn Asp Asn Leu Ser Ile Pro Leu Ser
            180   185   190

Tyr Cys Leu Ser Thr Ala Ile Leu Ser Tyr Ile Leu
            195   200

<210>   30
<211>   204
<212>   PRT
<213>   Rickettsia prowazekii

<400>   30

Met Lys Thr Glu Asp Phe Asp Phe Glu Lys Lys Arg Lys Ile Phe His
1   5   10   15

Ile Ser Ala Ile Ile Phe Pro Met Phe Tyr Leu Phe Val Pro Arg Ile
            20   25   30

Ala Ile Ala Leu Leu Leu Phe Ile Ile Thr Ser Ile Thr Leu Tyr Leu
            35   40   45

Asp Val Ile Arg His Asn Asn Ala Lys Ile Arg Lys Phe Val Thr Arg
        50   55   60

Phe Phe Ser Lys Ile Ile Arg Leu Lys Glu Asn Asn Gly Thr Phe Ala
65   70   75   80

Leu Ser Gly Ile Ser Phe Met Met Leu Gly Phe Phe Leu Thr Ser Ile
                85   90   95

Leu Phe Pro Lys Asn Leu Val Ile Cys Ser Trp Leu Ile Leu Ile Ile
            100   105   110

Ser Asp Cys Leu Ala Ala Leu Val Gly Ile Lys Ile Gly Ser Ser Leu
            115   120   125

Ser Asn Gly Lys Ser Ile Ala Gly Ser Phe Thr Phe Phe Val Ser Ala
    130   135   140

Leu Phe Ile Ser Ile Leu Val Tyr Phe Tyr Leu Gly Tyr Asn Thr Ser
145   150   155   160

Phe Val Ile Ile Ile Ile Ser Cys Ile Gly Ala Thr Ala Val Glu Phe
                165   170   175

```
Tyr Ser Lys Tyr Leu Arg Ile Asn Asp Asn Leu Ser Ile Pro Leu Ser
            180             185             190


Tyr Cys Leu Ser Thr Thr Ile Phe Pro Tyr Ile Leu
        195             200
```

<210> 31
<211> 204
<212> PRT
<213> Rickettsia sibirica

<400> 31

```
Met Glu Ile Lys Asp Phe Asp Phe Glu Lys Lys Arg Lys Ile Phe His
1               5               10              15


Leu Ser Ala Ile Ile Phe Pro Leu Leu Tyr Leu Phe Ile Pro Arg Thr
            20              25              30


Ala Ile Thr Leu Leu Leu Phe Ile Ile Thr Ala Ile Thr Leu Tyr Leu
        35              40              45


Asp Val Ser Arg His Asn Asn Ala Lys Ile Ser Glu Phe Val Thr Arg
    50              55              60


Phe Phe Ser Lys Val Ile Arg Leu Glu Glu Asn Asn Gly Ser Phe Ala
65              70              75              80


Leu Ser Gly Val Ser Phe Met Met Ile Gly Phe Phe Leu Thr Ala Leu
            85              90              95


Leu Phe Pro Lys Asn Leu Val Ile Cys Ser Trp Leu Ile Leu Ile Ile
            100             105             110


Ser Asp Cys Leu Ala Ala Leu Val Gly Val Lys Ile Gly Asn Ser Leu
        115             120             125


Gly Asn Gly Lys Ser Ile Ala Gly Ser Ile Thr Phe Leu Ala Ser Ala
    130             135             140


Ile Phe Ile Ser Ile Leu Val Tyr Phe Tyr Leu Gly Tyr Asn Thr Ser
145             150             155             160


Phe Ile Ile Ile Ile Ile Ser Cys Ile Gly Ala Thr Val Ala Glu Phe
            165             170             175


Tyr Ser Lys Asp Leu Arg Ile Asn Asp Asn Leu Ser Ile Pro Leu Ser
            180             185             190


Tyr Cys Leu Ser Thr Ala Ile Leu Ser Tyr Ile Leu
        195             200
```

<210> 32
<211> 216
<212> PRT
<213> Synechococcus sp.-WH-8102

<400> 32

```
Met Val His Leu Ile Gly Pro Ile Ala Ile Ser Leu Trp Leu Gly Ile
1               5                   10                  15


Val Val Leu Ile Ala Val Leu Thr Arg Gln Arg Trp Pro Asp Gln Gln
            20                  25                  30


Glu Leu Ser Arg Lys Ile Ile His Ile Gly Thr Gly Ala Val Val Pro
            35                  40                  45


Leu Ala Trp Phe Phe Ala Ile Pro Ala Trp Ile Ala Val Pro Phe Ala
        50                  55                  60


Val Leu Val Thr Leu Ala Thr Ala Ile Asn His Arg Trp Arg Ile Val
65                  70                  75                  80


Pro Ala Val Glu Asp Val Asn Arg Asn Ser Tyr Gly Thr Val Ala Tyr
                85                  90                  95


Gly Leu Ala Ile Thr Met Leu Leu Ile Leu Cys Trp Pro Ala Arg Ala
                100                 105                 110


Asp Ala Val Cys Ala Gly Val Leu Val Met Ala Leu Gly Asp Gly Leu
            115                 120                 125


Ala Gly Leu Ile Gly Arg Ser Val Asn Ser Ala Arg Trp Thr Val Leu
            130                 135                 140


Gly Gln Thr Lys Ser Val Ala Gly Thr Leu Thr Met Ala Leu Val Ser
145                 150                 155                 160


Thr Leu Val Leu Val Gly Leu Met Leu Val Ser Gly Asn Ala Ile Gly
                165                 170                 175


Trp Arg Val Ala Leu Gly Ile Ser Thr Met Ala Thr Ala Leu Glu Gln
            180                 185                 190


Val Ser Pro Ala Gly Val Asp Asn Leu Ser Val Pro Leu Leu Val Gly
            195                 200                 205


Leu Thr Trp Val Leu Leu Ile Ser
    210                 215
```

<210> 33
<211> 214
<212> PRT
<213> Thermosynechococcus elongatus BP-1

<400> 33

```
Met Phe Trp Ala Gly Ile Trp Val Thr Gly Trp Leu Gly Leu Val Leu
1               5                   10                  15

Leu Ile Ala Glu Leu Ile His Ala Trp Phe Pro Asn Ala Lys Glu Trp
            20                  25                  30

Ser Arg Lys Val Val His Ile Gly Ala Gly Gln Val Ile Leu Ile Ala
        35                  40                  45

Tyr Ala Leu Gly Val Pro Thr Arg Trp Gly Ile Ile Ala Ala Ala Ile
    50                  55                  60

Ala Gly Met Val Thr Leu Leu Ser Tyr Arg Val Ser Ile Phe Pro Ser
65                  70                  75                  80

Ile Ser Gly Val Gly Arg Gln Ser Trp Gly Thr Phe Phe Tyr Ala Val
                85                  90                  95

Ser Ile Gly Ile Leu Met Ala Leu Phe Trp Lys Thr Leu Pro Glu Leu
            100                 105                 110

Ala Val Leu Gly Ile Leu Val Met Ala Trp Gly Asp Gly Leu Ala Ala
        115                 120                 125

Leu Val Gly Ile His Trp Gly Arg His Pro Leu Pro Gly Thr Ser Lys
    130                 135                 140

Ser Trp Glu Gly Thr Leu Thr Met Phe Trp Val Ser Thr Leu Val Ala
145                 150                 155                 160

Ala Leu Ser Leu Thr Pro Ile Ala Ala Leu Glu Ser Leu Trp Ile Ala
            165                 170                 175

Pro Phe Val Gly Val Gly Ala Thr Leu Leu Glu Leu Ile Ala Trp Arg
            180                 185                 190

Gly Met Asp Asn Leu Thr Val Pro Ile Gly Ser Ala Leu Leu Ala Tyr
        195                 200                 205

Gly Leu Leu Asn Leu Ser
    210
```

<210> 34
<211> 244
<212> PRT
<213> Trichodesmium erythraeum-IMS101

<400> 34

```
Met Tyr Ile Leu Leu Leu Leu Asn Ala Ile Leu Phe Ser Phe Leu Ile
1               5                   10                  15
```

```
Val Ser Ile Ile Ser Thr Phe Pro Asn Ile Trp Leu Gln Val Phe Leu
         20              25              30


Val Gly Gly Trp Leu Gly Ile Ile Leu Ile Phe Ala Glu Ala Leu Asn
         35              40              45


Arg Phe Ala Lys Val Asp Pro Glu Ile Ser Arg Lys Val Val His Ile
     50              55              60


Gly Thr Gly Asn Val Ile Leu Phe Ala Trp Trp Leu Glu Ile Pro Pro
65              70              75              80


Trp Ile Gly Ile Thr Ala Gly Ile Ile Ser Ala Ala Ile Ala Leu Ile
             85              90              95


Ser Tyr Arg Leu Pro Ile Leu Pro Ser Val Asn Ser Val Gly Arg Lys
         100             105             110


Ser Leu Gly Thr Phe Phe Tyr Ala Val Ser Ile Gly Ile Leu Ile Gly
         115             120             125


Trp Phe Trp Ser Ile Gln Gln Pro Gln Tyr Ala Ala Ile Gly Ile Leu
     130             135             140


Thr Met Ala Trp Gly Asp Gly Phe Ala Ala Ile Ile Gly Gln Asn Phe
145             150             155             160


Gly Lys His Pro Tyr Gln Val Trp Gly Met Asn Lys Ser Trp Glu Gly
             165             170             175


Ser Leu Gly Met Cys Leu Val Ser Tyr Thr Val Cys Ser Leu Ile Leu
             180             185             190


Leu Ala Val Gln Gly Asn Ile Trp Gln Thr Trp Ile Val Ala Ile Pro
         195             200             205


Val Ala Leu Ala Ala Thr Ala Leu Glu Thr Leu Ser Lys Val Gly Leu
     210             215             220


Asp Asn Leu Thr Val Pro Leu Gly Ser Ala Ala Leu Cys Phe Phe Leu
225             230             235             240


Asn Gln Phe Phe
```

<210> 35
<211> 519
<212> PRT
<213> Saccharomyces cerevisiae

<400> 35

```
Met Val Ala Ile Ile Pro His Ala Ser Phe Thr Thr Ile Lys Leu Thr
1               5                   10                  15

Gln Lys Thr Glu Gly Ser Gln Met Pro Thr Glu Glu Ile Cys Lys Ile
            20                  25                  30

Asn Met Arg Thr Arg Lys Phe Asp Val Gly Gly Asn Ser Arg Asp Phe
        35                  40                  45

Glu Cys Phe Tyr Ser Asn Phe Val Gln Thr Val Ile Leu Leu Gly Thr
        50                  55                  60

Phe Phe Tyr Cys Val Glu Arg Leu Gln Pro Trp Ser Ile Val Thr Ala
65              70                  75                  80

Asp Ile Ser Tyr Lys Gln Ile Phe Val Asn Val Phe Val Val Cys Leu
                85                  90                  95

Ile Met Val Gly Leu Ile Phe Thr Lys Tyr Trp Gln His Gly Tyr Lys
            100                 105                 110

Ser Leu Pro Lys Phe Asp Thr Ile Tyr Ser Leu Tyr Leu Pro Phe Met
        115                 120                 125

Val Ser Leu Leu Phe Asp Thr Ser Ser Thr Val Ile Asn Thr Ile Leu
    130                 135                 140

Ile Leu Ser Val Leu Asn Ser Tyr Arg Trp Arg Thr Gln Leu Val Val
145                 150                 155                 160

Ile Ile Leu Gln Leu Cys Leu Ile Phe Phe Asn Phe Glu Ala Gly Asp
                165                 170                 175

Arg Leu Lys Asn Ile Ile Ser Ile Val Ile Asn Ser Leu Leu Ser Leu
        180                 185                 190

Ile Leu Lys Tyr Ile Gly Gln Leu Lys Ser Leu Asp Asn Ile Asp Ser
        195                 200                 205

Asn Leu Phe Ser Ile Leu Leu Thr Asn Ile Leu Tyr Val Ser Glu Ala
    210                 215                 220

Gly Thr Val His Phe Arg Ile Leu Lys Gly Ile Ile Leu Ala Leu Thr
225                 230                 235                 240

Thr Ile Ile Ser Ile Asn Tyr Val Leu Lys Lys Val Met His Phe Lys
                245                 250                 255

Pro Phe Met Leu Ser Ile Ser Phe Ala Ile Gly Leu Pro Leu Phe Ala
        260                 265                 270
```

```
Asn Thr Phe Ile His Leu Glu Asp Gly Glu Asn Pro Leu Leu Trp Leu
        275             280             285


Val Lys Tyr Ile Leu Glu Ser Thr Ile Arg Gln Lys Ile Leu Phe Ala
    290             295             300


Trp Ser Ser Ile Leu Ile Leu Ser Ile Pro Ser Ile Leu Ile Glu Lys
305             310             315             320


Asp Ser Leu Ser Leu Asn Thr Ser Arg Lys Leu Trp His Phe Ile Ile
            325             330             335


Phe Leu Leu Ile Ile Pro Ser Phe Gln Met Asp Ser Asn Phe Val Lys
            340             345             350


Ile Ala Leu Ser Gly Thr Ile Pro Val Phe Leu Ser Ile Glu Tyr Ile
        355             360             365


Arg Phe Gln Asn Leu Pro Pro Leu Gly Ser Ala Ile Glu Leu Gln Leu
    370             375             380


Arg Arg Phe Ala Asp Asp Arg Asp His Ser Gly Pro Leu Ile Ile Ser
385             390             395             400


Tyr Leu Tyr Leu Leu Phe Gly Ile Ser Thr Pro Leu Leu Met Asn Asn
            405             410             415


Ser Pro Met Gly Leu Ile Gly Leu Gly Ile Gly Asp Ser Leu Ala Ser
        420             425             430


Ile Ile Gly Lys Arg Tyr Gly Arg Ile Arg Trp Lys Gly Thr Gln Lys
        435             440             445


Thr Leu Glu Gly Thr Leu Ala Phe Ile Val Thr Ser Phe Ile Val Cys
    450             455             460


Leu Val Leu Leu Arg Phe Asp Lys Ala Ala Ile Phe Asn His Leu Thr
465             470             475             480


Thr Leu Gln Leu Leu Thr Leu Cys Thr Leu Ser Gly Val Leu Glu Gly
            485             490             495


Asn Ser Val Leu Asn Asp Asn Ile Leu Ile Pro Ala Phe Met Met Ile
        500             505             510


Cys Glu Lys Leu Ile Thr Leu
        515
```

<210> 36
<211> 290
<212> PRT
<213> Saccharomyces cerevisiae

<400> 36

```
Met Gly Thr Glu Asp Ala Ile Ala Leu Pro Asn Ser Thr Leu Glu Pro
1               5                   10                  15

Arg Thr Glu Ala Lys Gln Arg Leu Ser Ser Lys Ser His Gln Val Ser
            20              25                  30

Ala Lys Val Thr Ile Pro Ala Lys Glu Glu Ile Ser Ser Ser Asp Asp
        35                  40                  45

Asp Ala His Val Pro Val Thr Glu Ile His Leu Lys Ser His Glu Trp
    50                  55                  60

Phe Gly Asp Phe Ile Thr Lys His Glu Ile Pro Arg Lys Val Phe His
65                  70                  75                  80

Ser Ser Ile Gly Phe Ile Thr Leu Tyr Leu Tyr Thr Gln Gly Ile Asn
                85                  90                  95

Tyr Lys Asn Val Leu Trp Pro Leu Ile Tyr Ala Phe Ile Ile Leu Phe
            100                 105                 110

Ile Leu Asp Leu Ile Arg Leu Asn Trp Pro Phe Phe Asn Met Leu Tyr
            115                 120                 125

Cys Arg Thr Val Gly Ala Leu Met Arg Lys Lys Glu Ile His Thr Tyr
    130                 135                 140

Asn Gly Val Leu Trp Tyr Ile Leu Gly Leu Ile Phe Ser Phe Asn Phe
145                 150                 155                 160

Phe Ser Lys Asp Val Thr Leu Ile Ser Leu Phe Leu Leu Ser Trp Ser
             165                 170                 175

Asp Thr Ala Ala Ala Thr Ile Gly Arg Lys Tyr Gly His Leu Thr Pro
        180                 185                 190

Lys Val Ala Arg Asn Lys Ser Leu Ala Gly Ser Ile Ala Ala Phe Thr
        195                 200                 205

Val Gly Val Ile Thr Cys Trp Val Phe Tyr Gly Tyr Phe Val Pro Ala
    210                 215                 220

Tyr Ser Tyr Val Asn Lys Pro Gly Glu Ile Gln Trp Ser Pro Glu Thr
225                 230                 235                 240

Ser Arg Leu Ser Leu Asn Met Leu Ser Leu Leu Gly Gly Val Val Ala
            245                 250                 255

Ala Leu Ser Glu Gly Ile Asp Leu Phe Asn Trp Asp Asp Asn Phe Thr
```

```
        260                     265                     270
```

Ile Pro Val Leu Ser Ser Leu Phe Met Asn Ala Val Ile Lys Thr Phe
    275   280   285

Lys Lys
    290

<210> 37
<211> 288
<212> PRT
<213> Allium porrum

<400> 37

Thr Gly Pro Pro Leu Val Pro Leu Thr Pro His Leu Thr Thr Val Lys
1   5   10   15

Ser Thr Asn Thr Thr Val Thr Thr Arg Pro Ala Asn Phe Pro Thr Arg
    20   25   30

Ile His Ile Asp Arg Ser Ala Ala Lys Leu Ser Leu Arg Asn Gln Trp
    35   40   45

Ser Leu Thr Ala Ser Ile Leu Pro Val Asn Pro Leu Ala Gln Asp Ala
    50   55   60

Cys Ala Ala Val Ile Thr Ala Gly Ala Ala Leu Gly Leu Leu Arg Phe
65   70   75   80

Phe Glu Glu Leu Ala Lys Arg Gln Thr Phe Asp Gln Lys Leu Asn Arg
        85   90   95

Lys Leu Val His Ile Leu Val Gly Leu Val Phe Met Leu Phe Trp Pro
        100   105   110

Ile Phe Ser Ser Glu Trp Gln Ala Pro Leu Leu Ala Ala Leu Ala Pro
      115   120   125

Gly Ile Asn Ile Phe Arg Met Leu Phe Met Gly Leu Gly Ile Ile Lys
    130   135   140

Asn Glu Ala Met Val Gln Ser Ile Ser Arg His Gly Asp Tyr Arg Glu
145   150   155   160

Leu Leu Lys Gly Pro Leu Tyr Tyr Ala Cys Thr Ile Thr Leu Ala Thr
        165   170   175

Ser Val Phe Trp Arg Thr Ser Pro Val Gly Met Ala Ala Val Cys Asn
        180   185   190

Leu Cys Ala Gly Asp Gly Leu Ala Asp Ile Ile Gly Arg Arg Phe Gly
      195   200   205

Lys His Lys Leu Thr Tyr Asn Pro Asp Lys Ser Ile Glu Gly Ser Ala
    210   215   220

Ala Met Ala Leu Ala Gly Phe Val Ala Ser Val Leu Tyr Met His Tyr
225   230   235   240

Phe Ala Ile Phe Gly Phe Ile Glu Glu Ser Leu Gly Met Val Val Arg
           245   250   255

Phe Phe Leu Leu Ser Phe Ala Ser Ala Val Val Glu Ser Leu Pro Ile
        260   265   270

Ser Ser Glu Leu Asp Asp Asn Leu Thr Val Pro Leu Thr Ser Pro Arg
        275   280   285

<210> 38
<211> 289
<212> PRT
<213> Brassica napus

<400> 38

Asp Ser Ser Ser Cys Phe Phe Ser Pro Ile Pro Arg Phe Leu Thr Leu
1   5   10   15

Arg Ile Ala Thr Thr Thr Ala Leu Arg Ser Ala Ala Thr Phe Thr Leu
        20   25   30

Arg Arg Ser Pro Ser His Arg Ser Leu Thr Pro Ser Leu Ala Val Met
        35   40   45

Phe Pro Asp Asn Ser Val Leu Ser Asp Val Cys Ala Ser Gly Ile Thr
    50   55   60

Ser Val Val Ala Val Ser Cys Leu Gly Phe Trp Gly Glu Ile Gly Lys
65   70   75   80

Arg Gly Phe Phe Asp Gln Lys Leu Ile Arg Lys Leu Val His Ile Asn
         85   90   95

Ile Gly Leu Val Phe Met Leu Cys Trp Pro Leu Phe Ser Ser Gly Arg
        100   105   110

Gln Gly Ala Leu Leu Ala Ser Leu Val Pro Gly Leu Asn Ile Val Arg
      115   120   125

Met Leu Leu Leu Gly Leu Gly Val Tyr Gln Asp Glu Gly Thr Ile Lys
    130   135   140

Ser Met Ser Arg His Gly Asp Arg Arg Glu Leu Leu Lys Gly Pro Leu
145   150   155   160

Tyr Tyr Ala Leu Ser Ile Thr Ser Ala Cys Phe Phe Tyr Trp Lys Thr
                165   170   175

Ser Pro Ile Ala Ile Ala Val Ile Cys Asn Leu Cys Ala Gly Asp Gly
            180   185   190

Met Ala Asp Ile Val Gly Arg Arg Leu Gly Thr Glu Lys Leu Pro Tyr
            195   200   205

Asn Arg Asn Lys Ser Leu Ala Gly Ser Ile Gly Met Ala Ile Ala Gly
    210   215   220

Phe Leu Ala Ser Val Gly Tyr Met Tyr Tyr Phe Ser Ser Phe Gly Tyr
225   230   235   240

Met Glu Ser Thr Gly Trp Asp Met Ile Leu Arg Phe Leu Val Ile Ser
            245   250   255

Ile Ala Ser Ala Leu Ile Glu Ser Leu Pro Ile Ser Thr Asp Ile Asp
            260   265   270

Asp Asn Leu Thr Ile Pro Leu Thr Ser Ala Leu Val Gly Thr Leu Leu
            275   280   285

Phe

<210> 39
<211> 304
<212> PRT
<213> Brassica napus

<400> 39

Met Ala Ala Ala Leu Pro Leu Ser Pro Val Ser His Gln Leu Cys Arg
1   5   10   15

Ile Ser Asn Arg Phe Trp Tyr Asn Ala Met Thr Pro Arg Phe Cys Ser
            20   25   30

Pro Val Ser Ser Pro Cys Tyr Ile Gly Val Lys Gly Ile Gly Ser Ser
            35   40   45

Ser Gln Leu Arg Ala Arg His Pro Leu Ile Ser Ser Ala Ala Ser Thr
    50   55   60

Asp Tyr Leu Leu His Asp Val Gly Ala Thr Val Ala Val Leu Ser Gly
65   70   75   80

Ala Tyr Ala Leu Val Leu Leu Phe Glu Ser Leu Thr Lys Arg Asp Val
                85   90   95

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```
Ile Pro Gln Arg Leu Ser Arg Lys Leu Val His Ile Leu Ser Gly Leu
        100             105             110

Leu Phe Ala Leu Ser Trp Pro Ile Phe Ser Ala Ser Thr Glu Ala Arg
        115             120             125

Tyr Phe Ala Ala Phe Val Pro Leu Val Asn Gly Leu Arg Leu Val Val
    130             135             140

Asn Gly Leu Ser Val Ser Pro Asn Ser Thr Leu Ile Gln Ser Val Thr
145             150             155             160

Arg Glu Gly Arg Pro Glu Glu Leu Leu Lys Gly Pro Leu Phe Tyr Val
            165             170             175

Leu Ala Leu Leu Val Ala Ala Val Phe Phe Trp Arg Asp Ser Pro Thr
        180             185             190

Gly Met Ile Ser Leu Ala Met Met Cys Gly Gly Asp Gly Ile Ala Asp
        195             200             205

Ile Met Gly Arg Lys Tyr Gly Ser Tyr Lys Ile Pro Tyr Asn Pro Arg
    210             215             220

Lys Ser Leu Ala Gly Ser Ile Ser Met Phe Ile Phe Gly Phe Phe Ile
225             230             235             240

Ser Ile Gly Leu Leu Tyr Tyr Tyr Ser Ser Leu Gly Tyr Leu His Met
            245             250             255

Asn Trp Glu Thr Thr Phe Thr Arg Val Ala Ile Val Ser Leu Val Ala
        260             265             270

Thr Leu Val Glu Ser Leu Pro Ile Thr Asp Gln Ile Asp Asp Asn Val
        275             280             285

Ser Val Pro Leu Ala Thr Ile Leu Ala Ala Tyr Leu Ser Phe Gly Tyr
    290             295             300

<210>   40
<211>   240
<212>   PRT
<213>   Gossypium hirsutum-LIB3165

<400>   40

Met Leu Tyr Glu Asn Ser Leu Val Ser Asp Leu Phe Ala Ala Val Val
1               5               10              15

Cys Cys Gly Val Ile Phe Ala Phe Leu Leu Leu Trp Gln Val Thr Ala
            20              25              30

Lys Cys Gly Val Asp Gln Lys Leu Asn Arg Lys Leu Val His Ile Ser
                        Page 34
```

Ile Gly Leu Val Phe Met Leu Cys Trp Pro Leu Phe Ser Ala Gly Tyr
    50   55   60

Arg Gly Ala Ile Leu Ala Ala Ile Thr Pro Gly Val Asn Ile Ile Arg
65   70   75   80

Met Leu Leu Ile Gly Ser Gly Ile Trp Lys Asp Glu Ala Thr Val Lys
                85   90   95

Ser Met Ser Arg Tyr Gly Asn Tyr Arg Glu Leu Leu Lys Gly Pro Leu
            100   105   110

Tyr Tyr Ala Ile Thr Val Thr Leu Ala Cys Val Val Tyr Trp Arg Thr
        115   120   125

Ser Pro Ile Gly Ile Ala Ala Leu Cys Asn Leu Cys Ala Gly Asp Gly
    130   135   140

Leu Ala Asp Val Val Gly Arg Arg Leu Gly Arg Lys Lys Leu Pro Tyr
145   150   155   160

Asn Arg Asn Lys Ser Val Ala Gly Ser Val Ala Met Ala Thr Ala Gly
            165   170   175

Phe Leu Ser Ser Val Gly Tyr Met Tyr Tyr Phe Ser Tyr Phe Gly Tyr
            180   185   190

Ile Gln Glu Gly Trp Gly Met Ile Leu Arg Phe Leu Val Val Ser Leu
            195   200   205

Ala Ser Ala Leu Val Glu Ser Leu Pro Ile Ser Thr Glu Leu Asp Asp
    210   215   220

Asn Leu Thr Val Ser Leu Thr Ser Ile Phe Ile Gly Ser Leu Ile Phe
225   230   235   240

<210>   41
<211>   298
<212>   PRT
<213>   Gossypium hirsutum

<400>   41

Met Ser Leu Ser Leu Ser Phe Thr His Pro Ile Leu Ser Arg His Val
1   5   10   15

Tyr Ser Ala Val Phe Pro Pro Pro Arg Phe Leu Phe Leu Ser Pro Leu
            20   25   30

Ile Pro Thr Thr Ser Arg Phe Pro Ile Leu Tyr Arg Ala Pro Gln Arg
        35   40   45

Ala Thr Ala Leu Ser Ala Thr Ala Val Thr Ala Ser Ile Phe Arg Asp
   50   55   60

Thr Ala Ala Ser Ala Ser Val Phe Ala Gly Ala Tyr Ala Leu Val Phe
65   70   75   80

Thr Phe Asp Ile Leu Thr Gln Lys Glu Leu Ile Gln Gln Asn Leu Ser
          85   90   95

Arg Lys Leu Val His Ile Leu Ser Gly Leu Leu Phe Ala Ile Ser Trp
        100   105   110

Pro Ile Phe Ser Asn Ala Asp Glu Ala Arg Tyr Phe Ala Ser Leu Val
       115   120   125

Pro Leu Phe Asn Cys Leu Arg Leu Val Ile His Gly Leu Ser Leu Thr
   130   135   140

Asp Asp Gln Ser Leu Ile Lys Ser Val Thr Arg Glu Gly Asn Pro Lys
145   150   155   160

Glu Leu Leu Arg Gly Pro Leu Tyr Tyr Val Ala Met Leu Met Leu Cys
        165   170   175

Ala Leu Val Phe Trp Arg Glu Ser Pro Val Gly Val Ile Cys Leu Ala
        180   185   190

Met Met Cys Gly Gly Asp Gly Val Ala Asp Ile Ile Gly Arg Lys Tyr
        195   200   205

Gly Ser Ser Lys Ile Pro Tyr Asn Gln Ser Lys Ser Trp Val Gly Ser
   210   215   220

Ile Ser Met Phe Val Ser Gly Phe Ile Ile Ser Ile Gly Met Leu Tyr
225   230   235   240

Tyr Tyr Ser Ala Leu Gly Tyr Leu Gln Leu Asp Trp Gly Tyr Thr Leu
        245   250   255

His Arg Val Ala Phe Ile Ser Leu Val Ala Thr Val Val Glu Ser Leu
        260   265   270

Pro Ile Ser Met Leu Ile Asp Asp Asn Ile Ser Val Pro Leu Ala Ser
       275   280   285

Met Leu Ala Ala Tyr Leu Thr Phe Gly His
   290   295

<210> 42
<211> 318

<212> PRT
<213> Glycine max

<400> 42

```
Met Met Phe Leu Ser Phe Asn Met Ile Ser Gly Gly Asn Thr Leu Gln
1               5                   10                  15

Arg Phe Asp Pro Val Ala Cys Val Ser Ser Val Pro Leu Leu Leu Ala
                20              25                  30

Pro Thr Thr Arg Pro Thr Phe His Phe Pro Ser Pro Phe Leu Ser Lys
            35              40                  45

Pro Lys Pro Thr Tyr Leu Phe Thr Ser Phe Ser Ser Ser Ser Ser Ser
        50              55                  60

Ser Ser Ser Phe Phe Ser Ser Thr Thr Pro Pro Arg Ser Thr Met Leu
65                  70                  75                  80

His His Asp Pro Leu Val Ser Asp Val Tyr Ala Thr Ala Ile Ser Gly
                85                  90                  95

Val Val Ala Leu Ser Phe Leu Arg Leu Phe Gln Glu Thr Ala Lys Arg
                100                 105                 110

Asp Leu Phe Asp Gln Lys Leu Asn Arg Lys Leu Val His Ile Ser Ile
            115                 120                 125

Gly Leu Ile Phe Met Leu Cys Pro Leu Phe Ser Thr Glu Thr Trp Ala
    130                 135                 140

Ser Phe Phe Ala Ala Leu Ile Pro Gly Ile Asn Ile Phe Arg Met Leu
145                 150                 155                 160

Val Ile Gly Leu Gly Ile Leu Lys Asp Glu Ala Thr Val Lys Ser Met
                165                 170                 175

Ser Arg Phe Gly Asp Tyr Arg Glu Leu Leu Lys Gly Pro Leu Tyr Tyr
            180                 185                 190

Ala Ala Thr Ile Thr Leu Ala Ala Ile Ile Tyr Trp Arg Thr Ser Pro
        195                 200                 205

Ile Ser Ile Ala Ala Ile Cys Asn Leu Cys Ala Gly Asp Gly Met Ala
    210                 215                 220

Asp Ile Val Gly Arg Arg Leu Gly Gly Glu Lys Ile Pro Tyr Asn Lys
225                 230                 235                 240

Asn Lys Ser Phe Ala Gly Ser Ile Ala Met Ala Thr Ala Gly Phe Leu
            245                 250                 255
```

```
Thr Ser Ile Gly Tyr Met Trp Tyr Phe Ser Ser Phe Gly Phe Ile Glu
            260             265             270
```

```
Gly Ser Trp Lys Leu Val Leu Gly Phe Leu Leu Val Ser Ile Val Thr
            275             280             285
```

```
Ala Phe Val Glu Ser Leu Pro Ile Ser Thr Glu Leu Asp Asp Asn Leu
            290             295             300
```

```
Thr Val Pro Leu Thr Ser Ile Leu Val Gly Ser Ile Ile Leu
305             310             315
```

<210> 43
<211> 319
<212> PRT
<213> Glycine max

<220>
<221> misc_feature
<222> (158)..(158)
<223> Xaa can be any naturally occurring amino acid

<400> 43

```
Met Met Phe Leu Ser Phe Asn Met Ile Ser Gly Gly Asn Thr Leu Gln
1               5               10              15
```

```
Arg Phe Asp Pro Val Ala Cys Val Ser Ser Val Pro Leu Leu Leu Ala
            20              25              30
```

```
Pro Thr Thr Arg Pro Thr Phe His Phe Pro Ser Pro Phe Leu Ser Lys
            35              40              45
```

```
Pro Lys Pro Thr Tyr Leu Phe Thr Ser Phe Ser Ser Ser Ser Ser Ser
    50              55              60
```

```
Ser Ser Ser Phe Phe Ser Ser Thr Thr Pro Pro Arg Ser Thr Met Leu
65              70              75              80
```

```
His His Asp Pro Leu Val Ser Asp Val Tyr Ala Thr Ala Ile Ser Gly
            85              90              95
```

```
Val Val Ala Leu Ser Phe Leu Arg Leu Phe Gln Glu Thr Ala Lys Arg
            100             105             110
```

```
Asp Leu Phe Asp Gln Lys Leu Asn Arg Lys Leu Val His Ile Ser Ile
            115             120             125
```

```
Gly Leu Ile Phe Met Leu Cys Trp Pro Leu Phe Ser Thr Glu Thr Trp
            130             135             140
```

```
Ala Ser Phe Phe Ala Ala Leu Ile Pro Gly Ile Asn Ile Xaa Arg Met
145             150             155             160
```

Leu Val Ile Gly Leu Gly Ile Leu Lys Asp Glu Ala Thr Val Lys Ser
            165   170   175

Met Ser Arg Phe Gly Asp Tyr Arg Glu Leu Leu Lys Gly Pro Leu Tyr
            180   185   190

Tyr Ala Ala Thr Ile Thr Leu Ala Ala Ile Ile Tyr Trp Arg Thr Ser
            195   200   205

Pro Ile Ser Ile Ala Ala Ile Cys Asn Leu Cys Ala Gly Asp Gly Met
    210   215   220

Ala Asp Ile Val Gly Arg Arg Leu Gly Gly Glu Lys Ile Pro Tyr Asn
225   230   235   240

Lys Asn Lys Ser Phe Ala Gly Ser Ile Ala Met Ala Thr Ala Gly Phe
            245   250   255

Leu Thr Ser Ile Gly Tyr Met Trp Tyr Phe Ser Ser Phe Gly Phe Ile
            260   265   270

Glu Gly Ser Trp Lys Leu Val Leu Gly Phe Leu Leu Val Ser Ile Val
            275   280   285

Thr Ala Phe Val Glu Ser Leu Pro Ile Ser Thr Glu Leu Asp Asp Asn
    290   295   300

Leu Thr Val Pro Leu Thr Ser Ile Leu Val Gly Ser Ile Ile Leu
305   310   315

<210> 44
<211> 292
<212> PRT
<213> Glycine max

<220>
<221> misc_feature
<222> (148)..(148)
<223> Xaa can be any naturally occurring amino acid

<400> 44

Met Ala Ala Ala Ala Ala Trp Thr Gly Ala Ala Ser Pro Asn Ser Leu
1   5   10   15

Leu Leu Ser Arg Ser Pro Pro His Ala Ala Ala Leu Ala Pro Ser Pro
            20   25   30

Gly Ser Ser Met Arg Arg Arg Leu Leu Leu Gly Val Gly Thr Pro Ala
            35   40   45

Val Ala Ala Leu Ala Ala Ala Ala Pro Pro Ala Val Leu Gln Asp Gly

```
                 50                      55                      60

        Ala Val Thr Val Leu Ile Thr Ala Gly Ala Tyr Ser Leu Val Arg Val
        65                      70                      75                      80


        Phe Asp Glu Leu Thr Glu Arg Arg Leu Ile Glu Lys Ser Leu Ser Arg
                                85                      90                      95


        Lys Val Val His Val Leu Ser Gly Val Leu Phe Met Ser Ser Trp Pro
                        100                     105                     110


        Leu Phe Ser Asn Ser Thr Glu Ala Arg Tyr Phe Ala Ala Val Val Pro
                        115                     120                     125


        Phe Leu Asn Ser Met Arg Leu Leu Ile Tyr Gly Leu Arg Leu Tyr Thr
                130                     135                     140


        Asp Glu Ala Xaa Glu Leu Leu Arg Gly Pro Leu Tyr Tyr Val Leu Val
        145                     150                     155                     160


        Leu Leu Phe Ser Val Leu Val Phe Trp Arg Glu Ser Pro Ile Gly Ile
                        165                     170                     175


        Val Ser Leu Ser Met Met Ser Gly Gly Asp Gly Phe Ala Asp Ile Val
                        180                     185                     190


        Gly Arg Arg Tyr Gly Ser Ala Lys Leu Pro Phe Asn Arg Lys Lys Ser
                        195                     200                     205


        Trp Ala Gly Ser Ile Ser Met Phe Ile Ser Gly Phe Leu Leu Ser Ala
                210                     215                     220


        Met Met Met Leu Tyr Phe Ser Ser Leu Gly Tyr Ile Asp Val Ile Trp
        225                     230                     235                     240


        Glu Glu Ala Leu Gly Lys Leu Ala Leu Val Ala Leu Ala Ala Thr Val
                        245                     250                     255


        Val Glu Cys Val Pro Val Thr Glu Val Val Asp Asp Asn Ile Ser Val
                        260                     265                     270


        Pro Leu Ala Thr Met Leu Val Ala Phe Leu Leu Phe Ser Ser Asn Arg
                        275                     280                     285


        Thr Ile Val Asn
                290
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<210> 45
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<212> PRT
<213> Glycine max

<400> 45

Met Thr Leu Leu Ser Ser His Leu Leu Val Phe Ser Ala Val His His
1   5   10   15

Arg Ala Pro Pro Thr Thr Thr Thr Arg Asn Ser Pro Thr Thr Asn His
            20   25   30

Thr Val Arg Phe Leu Cys Ser Pro Gly Val Pro Pro Ala Val Arg Leu
        35   40   45

Asp Gln Arg Leu Pro Arg Phe Val Val Pro Gly Ala Gly Ala Glu Asp
    50   55   60

Leu Leu Tyr Asn Ala Gly Ala Thr Val Gly Val Leu Gly Gly Gly Tyr
65   70   75   80

Ala Leu Val Arg Ala Phe Asp Glu Leu Thr Arg Arg Asn Ile Leu Gln
                85   90   95

Gln Gly Leu Ser Arg Lys Leu Val His Ile Leu Ser Gly Leu Leu Phe
            100   105   110

Leu Val Ser Trp Pro Ile Phe Ser Asn Ser Pro Lys Ala Arg Tyr Phe
            115   120   125

Ala Ala Phe Val Pro Leu Val Asn Cys Leu Arg Leu Leu Val Asn Gly
    130   135   140

Leu Ser Leu Ala Ser Asp Glu Gly Leu Ile Lys Ser Val Thr Arg Glu
145   150   155   160

Gly Asp Pro Leu Glu Leu Leu Arg Gly Pro Leu Tyr Tyr Val Leu Ile
            165   170   175

Leu Ile Leu Ser Ala Leu Val Phe Trp Arg Glu Ser Pro Ile Gly Val
            180   185   190

Ile Ser Leu Ala Met Met Cys Ala Gly Asp Gly Ile Ala Asp Ile Ile
        195   200   205

Gly Arg Arg Tyr Gly Ser Met Lys Ile Pro Tyr Asn Glu His Lys Ser
    210   215   220

Leu Ala Gly Ser Met Ser Met Leu Val Phe Gly Phe Leu Val Ser Ile
225   230   235   240

Gly Met Leu Tyr Tyr Tyr Ser Val Leu Gly His Val Gln Leu Asp Trp
            245   250   255

Ala Ser Thr Leu Pro Arg Val Ala Phe Ile Ser Phe Val Ala Thr Leu
            260   265   270

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Val Glu Ser Leu Pro Ile Thr Lys Val Val Asp Asp Asn Ile Ser Val
      275   280   285

Pro Leu Ala Thr Met Ala Val Ala Phe Phe Thr Phe His His
    290   295   300

<210> 46
<211> 314
<212> PRT
<213> Oryza sativa

<400> 46

Met Ala Ala Ala Ala Arg Pro Val Asp Val Val Arg His Phe Pro Cys
1   5   10   15

Ser Ser Ser Val Ala Ala Ser Ser Ser Leu Leu Leu Ser Arg Ser Lys
      20   25   30

Ser Arg Leu Ala Ser Pro Ala Ala Ala Ala Ala Ser Ser Met Arg Arg
      35   40   45

Arg Leu Val Leu Gly Val Gly Ala Ala Ala Ala Pro Ala Val Ala Ala
      50   55   60

Leu Ala Ala Ser Ala Thr Pro Ala Ala Leu Arg Asp Cys Ala Ala Thr
65   70   75   80

Leu Leu Ile Thr Ala Gly Ala Tyr Ser Leu Val Arg Ala Phe Asp Gly
          85   90   95

Leu Thr Ala Arg Arg Leu Ile Glu Gln Asn Leu Ser Arg Lys Ile Val
         100   105   110

His Val Leu Ser Gly Val Leu Phe Met Ser Ser Trp Pro Leu Phe Ser
         115   120   125

Asn Ser Thr Glu Ala Arg Phe Phe Ala Ala Ile Val Pro Leu Leu Asn
         130   135   140

Cys Ile Arg Leu Leu Thr Tyr Gly Leu Arg Leu Ser Thr Asp Glu Ala
145   150   155   160

Leu Val Lys Ser Val Thr Arg Glu Gly Lys Pro Glu Glu Leu Leu Arg
         165   170   175

Gly Pro Leu Tyr Tyr Val Ile Val Leu Leu Val Ser Val Leu Val Phe
         180   185   190

Trp Arg Gln Ser Pro Ile Gly Ile Val Ser Leu Ser Met Met Ser Gly
         195   200   205

```
Gly Asp Gly Phe Ala Asp Ile Val Gly Arg Arg Tyr Gly Ser Ala Lys
    210             215             220

Leu Pro Phe Asn Glu Asn Lys Ser Trp Ile Gly Ser Ile Ser Met Phe
225             230             235             240

Ile Ser Gly Phe Leu Leu Ser Ala Leu Met Leu Phe Tyr Phe Ser Cys
            245             250             255

Leu Gly Tyr Phe Thr Val Cys Trp Asp Leu Ala Leu Gly Lys Leu Ala
            260             265             270

Leu Val Ala Leu Ala Ala Thr Val Val Glu Cys Ile Pro Val Asn Asp
            275             280             285

Val Val Asp Asp Asn Ile Ser Val Pro Leu Ala Thr Met Leu Ala Ala
    290             295             300

Tyr Leu Leu Phe Gly Tyr Ser Ser Cys Cys
305             310
```

<210> 47
<211> 269
<212> PRT
<213> Oryza sativa

<400> 47

```
Met Arg Arg Arg Leu Val Leu Gly Val Gly Ala Ala Ala Ala Pro Ala
1               5               10              15

Val Ala Ala Leu Ala Ala Ser Ala Thr Pro Ala Ala Leu Arg Asp Cys
            20              25              30

Ala Ala Thr Leu Leu Ile Thr Ala Gly Ala Tyr Ser Leu Val Arg Ala
            35              40              45

Phe Asp Gly Leu Thr Ala Arg Arg Leu Ile Glu Gln Asn Leu Ser Arg
    50              55              60

Lys Ile Val His Val Leu Ser Gly Val Leu Phe Met Ser Ser Trp Pro
65              70              75              80

Leu Phe Ser Asn Ser Thr Glu Ala Arg Phe Phe Ala Ala Ile Val Pro
            85              90              95

Leu Leu Asn Cys Ile Arg Leu Leu Thr Tyr Gly Leu Arg Leu Ser Thr
            100             105             110

Asp Glu Ala Leu Val Lys Ser Val Thr Arg Glu Gly Lys Pro Glu Glu
            115             120             125
```

```
Leu Leu Arg Gly Pro Leu Tyr Tyr Val Ile Val Leu Leu Val Ser Val
    130             135             140

Leu Val Phe Trp Arg Gln Ser Pro Ile Gly Ile Val Ser Leu Ser Met
145             150             155             160

Met Ser Gly Gly Asp Gly Phe Ala Asp Ile Val Gly Arg Arg Tyr Gly
            165             170             175

Ser Ala Lys Leu Pro Phe Asn Glu Asn Lys Ser Trp Ile Gly Ser Ile
            180             185             190

Ser Met Phe Ile Ser Gly Phe Leu Leu Ser Ala Leu Met Leu Phe Tyr
            195             200             205

Phe Ser Cys Leu Gly Tyr Phe Thr Val Cys Trp Asp Leu Ala Leu Gly
    210             215             220

Lys Leu Ala Leu Val Ala Leu Ala Ala Thr Val Val Glu Cys Ile Pro
225             230             235             240

Val Asn Asp Val Val Asp Asp Asn Ile Ser Val Pro Leu Ala Thr Met
            245             250             255

Leu Ala Ala Tyr Leu Leu Phe Gly Tyr Ser Ser Cys Cys
            260             265
```

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<210>   48
<211>   803
<212>   PRT
<213>   Oryza sativa

<400>   48
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```
Met Ala Gly Gly Gly Gly Lys Ser Val Ala Ala Ala Leu Ala Met Ala
1               5               10              15

Cys Phe Leu Leu Ile Leu Ala Ala Phe Ala Pro Pro Ala Ala Ala Ala
            20              25              30

Pro Pro Asp Ile Met Ser Ile Ile Arg Tyr Asn Ala Glu His Gly Val
            35              40              45

Arg Gly Leu Glu Arg Thr Glu Ala Glu Ala Arg Ala Ala Tyr Asp Leu
    50              55              60

Trp Leu Ala Arg His Arg Arg Gly Gly Gly Gly Ser Arg Asn Gly
65              70              75              80

Phe Ile Gly Glu His Glu Arg Arg Phe Arg Val Phe Trp Asp Asn Leu
            85              90              95

Lys Phe Val Asp Ala His Asn Ala Arg Ala Asp Glu Arg Gly Gly Phe
```

```
                 100                   105                    110

Arg Leu Gly Met Asn Arg Phe Ala Asp Leu Thr Asn Gly Glu Phe Arg
        115                 120                 125

Ala Thr Tyr Leu Gly Thr Thr Pro Ala Gly Arg Gly Arg Arg Val Gly
    130                 135                 140

Glu Ala Tyr Arg His Asp Gly Val Glu Ala Leu Pro Asp Ser Val Asp
145                 150                 155                 160

Trp Arg Asp Lys Gly Ala Val Val Ala Pro Val Lys Asn Gln Gly Gln
            165                 170                 175

Cys Gly Ser Cys Trp Ala Phe Ser Ala Val Ala Ala Val Glu Gly Ile
            180                 185                 190

Asn Lys Ile Val Thr Gly Glu Leu Val Ser Leu Ser Glu Gln Glu Leu
        195                 200                 205

Val Glu Cys Ala Arg Asn Gly Gln Asn Ser Gly Cys Asn Gly Gly Ile
    210                 215                 220

Met Asp Asp Ala Phe Ala Phe Ile Ala Arg Asn Gly Gly Leu Asp Thr
225                 230                 235                 240

Glu Glu Asp Tyr Pro Tyr Thr Ala Met Asp Gly Lys Cys Asn Leu Ala
            245                 250                 255

Lys Arg Ser Arg Lys Val Val Ser Ile Asp Gly Phe Glu Asp Val Pro
        260                 265                 270

Glu Asn Asp Glu Leu Ser Leu Gln Lys Ala Val Ala His Gln Pro Val
        275                 280                 285

Ser Val Ala Ile Asp Ala Gly Gly Arg Glu Phe Gln Leu Tyr Asp Ser
    290                 295                 300

Gly Val Phe Thr Gly Arg Cys Gly Thr Asn Leu Asp His Gly Val Val
305                 310                 315                 320

Ala Val Gly Tyr Gly Thr Asp Ala Ala Thr Gly Ala Ala Tyr Trp Thr
            325                 330                 335

Val Arg Asn Ser Trp Gly Pro Asp Trp Gly Glu Asn Gly Tyr Ile Arg
            340                 345                 350

Met Glu Arg Asn Val Thr Ala Arg Thr Gly Lys Cys Gly Ile Ala Met
        355                 360                 365

Met Ala Ser Tyr Pro Ile Lys Lys Gly Pro Asn Pro Lys Pro Ser Pro
```

370   375   380

Pro Ser Pro Ala Pro Ser Pro Pro Gln Gln Cys Asp Arg Tyr Ser Lys
385   390   395   400

Cys Pro Ala Gly Thr Thr Cys Cys Cys Asn Tyr Gly Ile Arg Asn His
                    405   410   415

Cys Ile Val Trp Gly Cys Cys Pro Val Glu Gly Ala Thr Cys Cys Lys
                420   425   430

Asp His Ser Thr Cys Cys Pro Lys Glu Tyr Pro Val Cys Asn Ala Lys
            435   440   445

Ala Arg Thr Cys Ser Lys Ser Lys Asn Ser Pro Tyr Asn Val Glu Ala
    450   455   460

Leu Ile Arg Thr Pro Ala Ala Met Ala Arg Ser Val Pro Glu Gln Pro
465   470   475   480

Asp Ser Ile Ser Phe Ser Val Tyr Arg Met Ala Ala Ala Ala Arg Pro
            485   490   495

Val Asp Val Val Arg His Phe Pro Cys Ser Ser Ser Val Ala Ala Ser
            500   505   510

Ser Ser Leu Leu Leu Ser Arg Ser Lys Ser Arg Leu Ala Ser Pro Ala
    515   520   525

Ala Ala Ala Ala Ser Ser Met Arg Arg Arg Leu Val Leu Gly Val Gly
    530   535   540

Ala Ala Ala Ala Pro Ala Val Ala Ala Leu Ala Ala Ser Ala Thr Pro
545   550   555   560

Ala Ala Leu Arg Asp Cys Ala Ala Thr Leu Leu Ile Thr Ala Gly Ala
            565   570   575

Tyr Ser Leu Val Arg Ala Phe Asp Gly Leu Thr Ala Arg Arg Leu Ile
            580   585   590

Glu Gln Asn Leu Ser Arg Lys Ile Val His Val Leu Ser Gly Val Leu
            595   600   605

Phe Met Ser Ser Trp Pro Leu Phe Ser Asn Ser Thr Glu Ala Arg Phe
    610   615   620

Phe Ala Ala Ile Val Pro Leu Leu Asn Cys Ile Arg Leu Leu Thr Tyr
625   630   635   640

Gly Leu Arg Leu Ser Thr Asp Glu Ala Leu Val Lys Ser Val Thr Arg
                                Page 46

```
                              645                          650                          655

Glu Gly Lys Pro Glu Glu Leu Leu Arg Gly Pro Leu Tyr Tyr Val Ile
            660                     665                 670

Val Leu Leu Val Ser Val Leu Val Phe Trp Arg Gln Ser Pro Ile Gly
            675                 680                 685

Ile Val Ser Leu Ser Met Met Ser Gly Gly Asp Gly Phe Ala Asp Ile
        690                 695                 700

Val Gly Arg Arg Tyr Gly Ser Ala Lys Leu Pro Phe Asn Glu Asn Lys
705                 710                 715                     720

Ser Trp Ile Gly Ser Ile Ser Met Phe Ile Ser Gly Phe Leu Leu Ser
                725                 730                 735

Ala Leu Met Leu Phe Tyr Phe Ser Cys Leu Gly Tyr Phe Thr Val Cys
            740                 745                 750

Trp Asp Leu Ala Leu Gly Lys Leu Ala Leu Val Ala Leu Ala Ala Thr
        755                 760                 765

Val Val Glu Cys Ile Pro Val Asn Asp Val Val Asp Asp Asn Ile Ser
    770                 775                 780

Val Pro Leu Ala Thr Met Leu Ala Ala Tyr Leu Leu Phe Gly Tyr Ser
785                 790                 795                     800

Ser Cys Cys
```

```
<210>  49
<211>  657
<212>  PRT
<213>  Oryza sativa

<400>  49

Met Asn Arg Phe Ala Asp Leu Thr Asn Gly Glu Phe Arg Ala Thr Tyr
1               5                   10                  15

Leu Gly Thr Thr Pro Ala Gly Arg Gly Arg Arg Val Gly Glu Ala Tyr
            20                  25                  30

Arg His Asp Gly Val Glu Ala Leu Pro Asp Ser Val Asp Trp Arg Asp
        35                  40                  45

Lys Gly Ala Val Val Ala Pro Val Lys Asn Gln Gly Gln Cys Gly Ser
        50                  55                  60

Cys Trp Ala Phe Ser Ala Val Ala Ala Val Glu Gly Ile Asn Lys Ile
65                  70                  75                      80
```

Page 47

Val Thr Gly Glu Leu Val Ser Leu Ser Glu Gln Glu Leu Val Glu Cys
         85   90   95

Ala Arg Asn Gly Gln Asn Ser Gly Cys Asn Gly Gly Ile Met Asp Asp
         100   105   110

Ala Phe Ala Phe Ile Ala Arg Asn Gly Gly Leu Asp Thr Glu Glu Asp
         115   120   125

Tyr Pro Tyr Thr Ala Met Asp Gly Lys Cys Asn Leu Ala Lys Arg Ser
    130   135   140

Arg Lys Val Val Ser Ile Asp Gly Phe Glu Asp Val Pro Glu Asn Asp
145   150   155   160

Glu Leu Ser Leu Gln Lys Ala Val Ala His Gln Pro Val Ser Val Ala
         165   170   175

Ile Asp Ala Gly Gly Arg Glu Phe Gln Leu Tyr Asp Ser Gly Val Phe
         180   185   190

Thr Gly Arg Cys Gly Thr Asn Leu Asp His Gly Val Val Ala Val Gly
       195   200   205

Tyr Gly Thr Asp Ala Ala Thr Gly Ala Ala Tyr Trp Thr Val Arg Asn
    210   215   220

Ser Trp Gly Pro Asp Trp Gly Glu Asn Gly Tyr Ile Arg Met Glu Arg
225   230   235   240

Asn Val Thr Ala Arg Thr Gly Lys Cys Gly Ile Ala Met Met Ala Ser
         245   250   255

Tyr Pro Ile Lys Lys Gly Pro Asn Pro Lys Pro Ser Pro Pro Ser Pro
         260   265   270

Ala Pro Ser Pro Pro Gln Gln Cys Asp Arg Tyr Ser Lys Cys Pro Ala
         275   280   285

Gly Thr Thr Cys Cys Cys Asn Tyr Gly Ile Arg Asn His Cys Ile Val
    290   295   300

Trp Gly Cys Cys Pro Val Glu Gly Ala Thr Cys Cys Lys Asp His Ser
305   310   315   320

Thr Cys Cys Pro Lys Glu Tyr Pro Val Cys Asn Ala Lys Ala Arg Thr
         325   330   335

Cys Ser Lys Ser Val Tyr Arg Met Ala Ala Ala Ala Arg Pro Val Asp
         340   345   350

Val Val Arg His Phe Pro Cys Ser Ser Ser Val Ala Ala Ser Ser Ser
     355   360   365

Leu Leu Leu Ser Arg Ser Lys Ser Arg Leu Ala Ser Pro Ala Ala Ala
     370   375   380

Ala Ala Ser Ser Met Arg Arg Arg Leu Val Leu Gly Val Gly Ala Ala
385   390   395   400

Ala Ala Pro Ala Val Ala Ala Leu Ala Ala Ser Ala Thr Pro Ala Ala
          405   410   415

Leu Arg Asp Cys Ala Ala Thr Leu Leu Ile Thr Ala Gly Ala Tyr Ser
          420   425   430

Leu Val Arg Ala Phe Asp Gly Leu Thr Ala Arg Arg Leu Ile Glu Gln
     435   440   445

Asn Leu Ser Arg Lys Ile Val His Val Leu Ser Gly Val Leu Phe Met
     450   455   460

Ser Ser Trp Pro Leu Phe Ser Asn Ser Thr Glu Ala Arg Phe Phe Ala
465   470   475   480

Ala Ile Val Pro Leu Leu Asn Cys Ile Arg Leu Leu Thr Tyr Gly Leu
          485   490   495

Arg Leu Ser Thr Asp Glu Ala Leu Val Lys Ser Val Thr Arg Glu Gly
          500   505   510

Lys Pro Glu Glu Leu Leu Arg Gly Pro Leu Tyr Tyr Val Ile Val Leu
          515   520   525

Leu Val Ser Val Leu Val Phe Trp Arg Gln Ser Pro Ile Gly Ile Val
     530   535   540

Ser Leu Ser Met Met Ser Gly Gly Asp Gly Phe Ala Asp Ile Val Gly
545   550   555   560

Arg Arg Tyr Gly Ser Ala Lys Leu Pro Phe Asn Glu Asn Lys Ser Trp
          565   570   575

Ile Gly Ser Ile Ser Met Phe Ile Ser Gly Phe Leu Leu Ser Ala Leu
          580   585   590

Met Leu Phe Tyr Phe Ser Cys Leu Gly Tyr Phe Thr Val Cys Trp Asp
     595   600   605

Leu Ala Leu Gly Lys Leu Ala Leu Val Ala Leu Ala Ala Thr Val Val
     610   615   620

```
Glu Cys Ile Pro Val Asn Asp Val Val Asp Asp Asn Ile Ser Val Pro
625             630             635             640

Leu Ala Thr Met Leu Ala Ala Tyr Leu Leu Phe Gly Tyr Ser Ser Cys
                645             650             655

Cys


<210> 50
<211> 246
<212> PRT
<213> Oryza sativa

<400> 50

Met Ala Ala Ala Ile Pro Pro Glu Ala Ser Gly Leu Ala His Asp Leu
1               5               10              15

Gly Ser Ala Ala Val Thr Ala Gly Val Ala Leu Ala Leu Leu Arg Phe
            20              25              30

Phe Glu Glu Leu Ala Lys Arg Gly Val Phe Glu Gln Lys Leu Asn Arg
        35              40              45

Lys Leu Val His Ile Thr Ile Gly Met Val Phe Leu Leu Phe Trp Pro
    50              55              60

Leu Phe Ser Ser Gly Ser Tyr Ala Pro Phe Leu Ala Ala Val Ala Pro
65              70              75              80

Gly Ile Asn Ile Ile Arg Met Leu Leu Leu Gly Leu Gly Val Met Lys
            85              90              95

Asn Glu Ala Met Val Lys Ser Met Ser Arg Ser Gly Asp Pro Arg Glu
            100             105             110

Leu Leu Lys Gly Pro Leu Tyr Tyr Ala Thr Thr Ile Thr Phe Ala Thr
        115             120             125

Ser Ile Phe Trp Arg Thr Ser Pro Ile Ala Ile Ala Leu Ile Cys Asn
    130             135             140

Leu Cys Ala Gly Asp Gly Ile Ala Asp Ile Val Gly Arg Arg Leu Gly
145             150             155             160

Gln Glu Lys Leu Pro Tyr Asn Pro Asn Lys Ser Tyr Ala Gly Ser Ile
            165             170             175

Ala Met Ala Leu Ala Gly Phe Met Ala Ser Ile Gly Tyr Met His Tyr
            180             185             190
```

Phe Gln Ser Phe Gly Phe Ile Glu Glu Ser Trp Ser Leu Ala Phe Gly
        195   200   205

Phe Leu Val Val Ser Val Thr Ala Ala Leu Val Glu Ser His Pro Ile
    210   215   220

Ser Thr His Leu Asp Asp Asn Leu Thr Val Pro Leu Thr Ser Phe Leu
225   230   235   240

Val Gly Ser Leu Val Phe
                245

<210> 51
<211> 271
<212> PRT
<213> Oryza sativa

<400> 51

Met Glu Ser Pro Val Leu Arg Asp Ala Gly Ala Ala Val Leu Thr Gly
1   5   10   15

Ala Thr Ala Leu Ala Val Leu Arg Phe Trp Glu Glu Val Gly Asn Arg
        20   25   30

Ala Leu Leu Asp Gln Lys Leu Cys Arg Lys Leu Val His Ile Thr Val
        35   40   45

Gly Leu Val Tyr Phe Leu Met Trp Pro Leu Phe Ser Ala Asp Asp Val
    50   55   60

Tyr Ala Pro Phe Leu Ala Ser Ile Val Ile Ala Phe Asn Ile Ile Lys
65   70   75   80

Val Thr Leu Ile Gly Leu Gly Ile Val Lys Asp Asp Gly Val Ile Asn
            85   90   95

Ser Met Thr Arg Asn Gly Asp Pro Arg Glu Leu Leu Lys Gly Pro Leu
        100   105   110

Tyr Tyr Ala Cys Ala Met Thr Leu Ala Thr Val Ile Phe Trp Arg Thr
        115   120   125

Ser Pro Ile Ser Ile Ala Val Ile Cys Asn Leu Cys Ala Gly Asp Gly
    130   135   140

Val Ala Asp Ile Ala Gly Arg Gln Leu Gly Arg Ile Lys Leu Pro Tyr
145   150   155   160

Asn Pro Asp Lys Ser Tyr Ala Gly Ser Ile Ala Met Phe Leu Ala Gly
            165   170   175

```
Phe Leu Ala Ser Ile Leu Tyr Met Cys Tyr Phe His Leu Phe Gly Phe
        180                 185                 190


Val Glu Glu Ser Trp Thr Met Val Ile Ala Phe Gly Val Thr Ser Leu
        195                 200                 205


Ser Ala Ala Ile Val Glu Ser Leu Pro Ile Ser Thr Arg Leu Asp Asp
210                 215                 220


Asn Leu Thr Val Pro Leu Ala Ser Val Leu Ile Gly Val Leu Val Phe
225                 230                 235                 240


Tyr Tyr Ile Gly Ala Arg Asn Leu Cys Cys Met Ser Ala Asp Ser Ser
                245                 250                 255


Asp Ile Ser Ala Leu Val Gln Asn Gln Met Phe Leu Gly Arg Phe
                260                 265                 270
```

<210> 52
<211> 271
<212> PRT
<213> Oryza sativa

<400> 52

```
Met Glu Ser Gln Val Leu Arg Asp Ala Gly Ala Ala Val Leu Thr Gly
1               5                   10                  15


Ala Thr Ala Leu Ala Val Leu Arg Phe Trp Glu Glu Val Gly Asn Arg
            20                  25                  30


Ala Leu Leu Asp Gln Lys Leu Cys Arg Lys Leu Val His Ile Thr Val
        35                  40                  45


Gly Leu Val Tyr Phe Leu Met Trp Pro Leu Phe Ser Ala Asp Asp Val
    50                  55                  60


Tyr Ala Pro Phe Leu Ala Ser Ile Val Ile Ala Phe Asn Ile Ile Lys
65                  70                  75                  80


Val Thr Leu Ile Gly Leu Gly Ile Val Lys Asp Asp Gly Val Ile Asn
                85                  90                  95


Ser Met Thr Arg Asn Gly Asp Pro Arg Glu Leu Leu Lys Gly Pro Leu
            100                 105                 110


Tyr Tyr Ala Cys Ala Met Thr Leu Ala Thr Val Ile Phe Trp Arg Thr
        115                 120                 125


Ser Pro Ile Ser Ile Ala Val Ile Cys Asn Leu Cys Ala Gly Asp Gly
        130                 135                 140


Val Ala Asp Ile Ala Gly Arg Gln Leu Gly Arg Ile Lys Leu Pro Tyr
```

145   150   155   160

Asn Pro Asp Lys Ser Tyr Ala Gly Ser Ile Ala Met Phe Leu Ala Gly
            165   170   175

Phe Leu Ala Ser Ile Leu Tyr Met Cys Tyr Phe His Leu Phe Gly Phe
            180   185   190

Val Glu Glu Ser Trp Thr Met Val Ile Ala Phe Gly Val Thr Ser Leu
        195   200   205

Ser Ala Ala Ile Val Glu Ser Leu Pro Ile Ser Thr Arg Leu Asp Asp
    210   215   220

Asn Leu Thr Val Pro Leu Ala Ser Val Leu Ile Gly Val Leu Val Phe
225   230   235   240

Tyr Tyr Ile Gly Ala Arg Asn Leu Cys Cys Met Ser Ala Asp Ser Ser
            245   250   255

Asp Ile Ser Ala Leu Val Gln Asn Gln Met Phe Leu Gly Arg Phe
            260   265   270

<210> 53
<211> 205
<212> PRT
<213> Sorghum bicolor

<400> 53

Met Ala Ala Ala Thr Ala Trp Pro Gly Ala Ala Ala Ser Asn Ser Leu
1   5   10   15

Leu Leu Ser Arg Ser Pro Pro His Ala Ala Ala Ala Ala Leu Ala Leu
            20   25   30

Ala Pro Ser Pro Gly Ser Ser Met Arg Arg Arg Leu Ile Leu Gly Val
        35   40   45

Gly Thr Pro Ala Val Ala Ala Leu Ala Ala Ala Ala Pro Pro Ala Val
    50   55   60

Leu Gln Asp Gly Ala Val Thr Val Leu Ile Thr Ala Gly Ala Tyr Ser
65   70   75   80

Leu Val Arg Val Phe Asp Glu Leu Thr Glu Arg Arg Leu Ile Glu Lys
            85   90   95

Ser Leu Ser Arg Lys Val Val His Val Leu Ser Gly Val Leu Phe Met
            100   105   110

Ser Ser Trp Pro Leu Phe Ser Asn Ser Thr Glu Ala Arg Tyr Phe Ala
            115   120   125

Ala Val Val Pro Leu Leu Asn Ser Ile Arg Leu Leu Ile Tyr Gly Leu
    130   135   140

Arg Leu Tyr Thr Asp Glu Ala Leu Val Lys Ser Val Thr Arg Glu Gly
145   150   155   160

Lys Pro Glu Glu Leu Leu Arg Gly Pro Leu Tyr Tyr Val Leu Val Leu
                165   170   175

Leu Phe Ser Val Leu Val Phe Trp Arg Glu Ser Pro Val Gly Ile Val
            180   185   190

Ser Leu Ser Met Met Ser Gly Gly Asp Gly Phe Ala Asp
        195   200   205

<210> 54
<211> 202
<212> PRT
<213> Sorghum bicolor

<220>
<221> misc_feature
<222> (18)..(18)
<223> Xaa can be any naturally occurring amino acid

<400> 54

Lys Leu Ser Arg Lys Leu Val His Ile Ser Val Gly Leu Val Phe Leu
1   5   10   15

Leu Xaa Trp Pro Leu Phe Ser Ser Gly Trp Tyr Ala Pro Phe Leu Ala
            20   25   30

Ala Leu Ala Pro Gly Val Asn Val Ile Arg Met Leu Leu Leu Gly Leu
        35   40   45

Gly Leu Met Lys Asn Glu Ala Met Val Lys Ser Ile Ser Arg Ser Gly
    50   55   60

Asp Tyr Arg Glu Leu Leu Lys Gly Pro Leu Tyr Tyr Ala Thr Thr Ile
65   70   75   80

Thr Phe Ala Thr Ser Val Leu Trp Arg Thr Ser Pro Val Ala Ile Ala
            85   90   95

Leu Ile Cys Asn Leu Cys Ala Gly Asp Gly Ile Ala Asp Val Val Gly
            100   105   110

Arg Arg Leu Gly Lys Glu Lys Leu Pro Tyr Asn Pro Asn Lys Ser Tyr
        115   120   125

Ala Gly Ser Ile Ala Met Ala Val Ala Gly Phe Leu Ala Ser Val Gly
                    Page 54

```
            130                  135                  140
```

```
Tyr Met His Tyr Phe His Thr Phe Gly Phe Ile Glu Glu Thr Trp Tyr
145                 150                 155                 160
```

```
Met Ala Leu Gly Phe Leu Val Val Ser Val Ala Ala Thr Leu Val Glu
                165                 170                 175
```

```
Ser His Pro Ile Ser Thr Glu Leu Asp Asp Asn Leu Thr Val Pro Leu
                180                 185                 190
```

```
Thr Ser Phe Leu Val Gly Ser Leu Ile Phe
                195                 200
```

```
<210>  55
<211>  191
<212>  PRT
<213>  Sorghum bicolor
```

```
<400>  55
```

```
Ser Thr Ser Thr Cys Ser Asn Ser Thr Glu Ala Arg Tyr Phe Ala Ala
1               5                   10                  15
```

```
Val Val Pro Leu Leu Asn Ser Ile Arg Leu Leu Ile Tyr Gly Leu Arg
            20                  25                  30
```

```
Leu Tyr Thr Asp Glu Ala Leu Val Lys Ser Val Thr Arg Glu Gly Lys
        35                  40                  45
```

```
Pro Glu Glu Leu Leu Arg Gly Pro Leu Tyr Tyr Val Leu Val Leu Leu
    50                  55                  60
```

```
Phe Ser Val Leu Val Phe Trp Arg Glu Ser Pro Val Gly Ile Val Ser
65                  70                  75                  80
```

```
Leu Ser Met Met Ser Gly Gly Asp Gly Phe Ala Asp Ile Val Gly Arg
                85                  90                  95
```

```
Arg Tyr Gly Ser Val Lys Leu Pro Phe Asn Lys Lys Lys Ser Trp Ala
            100                 105                 110
```

```
Gly Ser Ile Ser Met Phe Ile Ser Gly Phe Leu Leu Ser Ala Met Met
            115                 120                 125
```

```
Met Phe Tyr Phe Ser Ser Leu Gly Tyr Ile Asp Val Ile Trp Gln Glu
    130                 135                 140
```

```
Ala Leu Gly Lys Leu Ala Leu Val Ala Leu Ala Ala Thr Val Val Glu
145                 150                 155                 160
```

```
Cys Ile Pro Val Thr Glu Val Val Asp Asp Asn Ile Ser Val Pro Leu
                165                 170                 175
```

Ala Thr Met Leu Val Ala Phe Leu Leu Phe Ser Ser Asn Ala Gln
        180   185   190

<210> 56
<211> 296
<212> PRT
<213> Triticum aestivum

<400> 56

Leu His Thr Arg Leu Arg Ser Arg Pro Leu Cys Ser Pro Thr Ser Ser
1   5   10   15

Ala Pro Thr Val Ser Ser Ser Ser Ala Pro Pro Ser Leu Arg Phe Arg
        20   25   30

Phe Gly Phe Pro Arg Arg Gly Cys Ala Ala Asp Arg Ser Arg Arg Ala
        35   40   45

Thr Thr Met Ala Ala Val Val Ser Pro Gly Asp Gly Gly Leu Val His
     50   55   60

Asp Leu Val Ser Ser Gly Val Thr Ala Ala Ile Ala Leu Gly Leu Leu
65   70   75   80

Arg Phe Phe Glu Glu Leu Ala Lys Arg Gly Val Cys Asp Gln Lys Leu
        85   90   95

Asn Arg Lys Leu Val His Ile Thr Ile Gly Met Val Phe Leu Leu Phe
        100   105   110

Trp Pro Leu Phe Ser Ser Gly Arg Tyr Ala Pro Phe Phe Ala Ala Leu
        115   120   125

Ala Pro Gly Ile Asn Ile Ile Arg Met Leu Leu Leu Gly Leu Gly Ile
        130   135   140

Met Lys Asn Glu Ala Met Val Lys Ser Met Ser Arg Ser Gly Asp His
145   150   155   160

Arg Glu Leu Leu Lys Gly Pro Leu Tyr Tyr Ala Thr Thr Ile Thr Leu
        165   170   175

Ala Thr Ser Val Leu Trp Arg Thr Ser Pro Ile Ala Ile Ala Leu Val
        180   185   190

Cys Asn Leu Cys Ala Gly Asp Gly Ile Ala Asp Val Val Gly Arg Arg
        195   200   205

Leu Gly Lys Glu Lys Leu Pro Tyr Asn Pro Asn Lys Ser Tyr Ala Gly
     210   215   220

```
Ser Ile Ala Met Ala Val Ala Gly Phe Leu Ala Ser Ile Gly Tyr Met
225             230             235             240
```

```
His Tyr Phe His Ser Phe Gly Leu Met Glu Lys Ser Trp Tyr Met Thr
            245             250             255
```

```
Leu Gly Phe Leu Val Val Ser Val Ala Ala Ala Leu Val Glu Ser His
            260             265             270
```

```
Pro Ile Ser Thr Glu Leu Asp Asp Asn Leu Thr Val Pro Leu Thr Ser
        275             280             285
```

```
Phe Leu Val Gly Ser Leu Ile Leu
    290             295
```

<210> 57
<211> 292
<212> PRT
<213> Triticum aestivum

<400> 57

```
Leu Cys Glu Ser Val Cys Glu Leu Arg Gly Ala Ser Val Gly Gly Ser
1               5               10              15
```

```
Met Trp Pro Glu Ser Pro Pro Leu Arg Asp Ala Gly Ala Ala Val Leu
            20              25              30
```

```
Thr Gly Cys Val Ala Met Ala Val Leu Arg Phe Trp Glu Glu Val Gly
        35              40              45
```

```
Asn Arg Ala Leu Leu Asp Gln Lys Leu Cys Arg Lys Leu Val His Ile
    50              55              60
```

```
Ser Val Gly Leu Val Tyr Phe Leu Met Trp Pro Leu Phe Ser Ala Asp
65              70              75              80
```

```
Asp Val Tyr Ala Pro Phe Leu Ala Ser Ile Val Ile Ala Leu Asn Ile
            85              90              95
```

```
Ile Lys Val Ile Leu Ile Gly Ser Gly Val Val Lys Asp Asp Gly Val
            100             105             110
```

```
Val Asn Ser Met Thr Arg Asn Gly Asp Tyr Arg Glu Leu Leu Lys Gly
        115             120             125
```

```
Pro Leu Tyr Tyr Ala Cys Thr Ile Thr Leu Thr Thr Val Ile Phe Trp
    130             135             140
```

```
Arg Thr Ser Pro Ile Ser Ile Ala Val Ile Cys Asn Leu Cys Ala Gly
145             150             155             160
```

Asp Gly Val Ala Asp Ile Ala Gly Arg Arg Phe Gly His Val Lys Leu
            165   170   175

Pro His Asn Pro Asp Lys Ser Tyr Ala Gly Ser Ile Ala Met Phe Phe
            180   185   190

Ala Gly Phe Val Ala Ser Ile Leu Phe Met Cys Tyr Phe His Leu Phe
            195   200   205

Gly Phe Val Glu Gln Ser Trp Thr Met Val Ala Ala Phe Gly Val Thr
    210   215   220

Ser Leu Ala Ala Ala Ile Val Glu Ser Leu Pro Val Ser Thr Leu Leu
225   230   235   240

Asp Asp Asn Leu Thr Thr Pro Ile Ala Ser Ala Leu Val Gly Ser Leu
            245   250   255

Val Phe Tyr Tyr Val Gly Gly Gly Gly Gly Ala Gly Ser Gly Asp Gly
            260   265   270

Thr Ser Ile Ser Ala Thr Ala Ala Met Val Phe Ala Gly Ser Ser Tyr
            275   280   285

Tyr Ser Glu Gly
    290

<210> 58
<211> 300
<212> PRT
<213> Triticum aestivum

<400> 58

Met Ala Ala Ala Arg Pro Ala Leu Pro Ser Ser Pro Thr Ser Leu Leu
1   5   10   15

Leu Ala Arg Ser Thr Ser Ala Pro Asp Leu Ala Ala Arg Arg Pro Arg
            20   25   30

Arg Trp Leu Val Ala Ala Ala Gly Val Pro Ala Val Ala Gly Ala Leu
        35   40   45

Ala Ala Ser Ala Ser Thr Pro Ala Ala Ser Met Leu Leu Arg Asp Gly
    50   55   60

Gly Ala Thr Leu Leu Val Thr Ala Gly Ala Tyr Ser Leu Val Arg Ala
65   70   75   80

Phe Asp Ala Leu Thr Glu Arg Arg Leu Val Gln Gln Ser Leu Ser Arg
            85   90   95

Lys Val Val His Val Leu Ser Gly Val Phe Phe Met Ala Ser Trp Pro

                   100   105   110

Leu Phe Ser Asn Ser Thr Ser Ala Arg Phe Phe Ala Ala Val Val Pro
        115   120   125

Phe Leu Asn Cys Val Arg Leu Leu Thr Tyr Gly Leu Gly Phe Tyr Ser
        130   135   140

Asp Glu Ala Leu Val Lys Ser Val Thr Arg Glu Gly Lys Arg Glu Glu
145   150   155   160

Leu Leu Arg Gly Pro Leu Tyr Tyr Val Ile Val Leu Leu Ile Ile Val
                165   170   175

Leu Val Phe Trp Arg Asp Ser Pro Ile Gly Ile Val Ser Leu Ser Met
            180   185   190

Met Ser Gly Gly Asp Gly Phe Ala Asp Ile Val Gly Arg Arg Phe Gly
        195   200   205

Ser Leu Lys Leu Pro Phe Asn Lys Lys Lys Ser Trp Val Gly Ser Ala
        210   215   220

Ala Met Phe Ile Ser Gly Phe Leu Leu Ser Ala Leu Met Leu Ser Tyr
225   230   235   240

Phe Ser Trp Leu Gly Tyr Ile His Val Ser Trp Asp Gln Ala Leu Gly
            245   250   255

Lys Leu Val Leu Val Ala Leu Ala Ala Thr Val Val Glu Cys Ile Pro
            260   265   270

Val Thr Asp Val Val Asp Asp Asn Ile Ser Val Pro Leu Ala Thr Met
            275   280   285

Leu Val Ala Phe Leu Leu Phe Gly Asn Thr Ala Asn
    290   295   300

<210>   59
<211>   157
<212>   PRT
<213>   Zea mays

<400>   59

Leu Ala Ala Leu Thr Ile Thr Thr Leu Leu Leu Tyr Arg Glu Leu Leu
1   5   10   15

Arg Gly Pro Leu Tyr Tyr Val Leu Val Leu Leu Phe Ser Val Leu Val
        20   25   30

Phe Trp Arg Glu Ser Pro Ile Gly Ile Val Ser Leu Ser Met Met Ser
        35   40   45

Gly Gly Asp Gly Phe Ala Asp Ile Val Gly Arg Arg Tyr Gly Ser Ala
    50   55   60

Lys Leu Pro Phe Asn Arg Lys Lys Ser Trp Ala Gly Ser Ile Ser Met
65   70   75   80

Phe Ile Ser Gly Phe Leu Leu Ser Ala Met Met Met Leu Tyr Phe Ser
            85   90   95

Ser Leu Gly Tyr Ile Asp Val Ile Trp Glu Glu Ala Leu Gly Lys Leu
        100   105   110

Ala Leu Val Ala Leu Ala Ala Thr Val Val Glu Cys Val Pro Val Thr
        115   120   125

Glu Val Val Asp Asp Asn Ile Ser Val Pro Leu Ala Thr Met Leu Val
    130   135   140

Ala Phe Leu Leu Phe Ser Ser Asn Arg Thr Ile Val Asn
145   150   155

<210> 60
<211> 188
<212> PRT
<213> Zea mays

<400> 60

Ala Pro Pro Ala Ala Leu Gln Asp Gly Ala Val Thr Val Leu Ile Thr
1   5   10   15

Ala Gly Ala Tyr Ser Leu Val Arg Val Phe Asp Glu Leu Thr Glu Arg
            20   25   30

Arg Leu Ile Glu Lys Ser Leu Ser Arg Lys Val Val His Val Leu Ser
        35   40   45

Gly Val Leu Phe Met Ser Ser Trp Pro Leu Phe Ser Asn Ser Thr Glu
    50   55   60

Ala Arg Tyr Phe Ala Ala Val Val Pro Phe Leu Asn Ser Met Arg Leu
65   70   75   80

Leu Ile Tyr Gly Leu Arg Leu Tyr Thr Asp Glu Ala Leu Val Lys Ser
            85   90   95

Val Thr Arg Glu Gly Lys Pro Glu Glu Leu Leu Arg Gly Pro Leu Tyr
        100   105   110

Tyr Val Leu Val Leu Leu Phe Ser Val Leu Val Phe Trp Arg Glu Ser
        115   120   125

Pro Ile Gly Ile Val Ser Leu Ser Met Met Ser Gly Gly Asp Gly Phe
    130   135   140

Ala Asp Ile Val Gly Arg Arg Tyr Gly Ser Ala Lys Leu Pro Phe Asn
145   150   155   160

Arg Lys Lys Ser Trp Gly Arg Ser Ile Ser Met Phe Ile Ser Cys Phe
            165   170   175

Leu Leu Ser Ala Met Met Met Leu Tyr Phe Ser Ser
            180   185

<210> 61
<211> 303
<212> PRT
<213> Zea mays

<400> 61

Met Ala Ala Ala Ala Ala Trp Thr Gly Ala Ala Ser Pro Asn Ser Leu
1   5   10   15

Leu Leu Ser Arg Ser Pro Pro His Ala Ala Ala Leu Ala Pro Ser Pro
            20   25   30

Gly Ser Ser Met Arg Arg Arg Leu Leu Leu Gly Val Gly Thr Pro Ala
            35   40   45

Val Ala Ala Leu Ala Ala Ala Ala Pro Pro Ala Val Leu Gln Asp Gly
    50   55   60

Ala Val Thr Val Leu Ile Thr Ala Gly Ala Tyr Ser Leu Val Arg Val
65   70   75   80

Phe Asp Glu Leu Thr Glu Arg Arg Leu Ile Glu Lys Ser Leu Ser Arg
            85   90   95

Lys Val Val His Val Leu Ser Gly Val Leu Phe Met Ser Ser Trp Pro
            100   105   110

Leu Phe Ser Asn Ser Thr Glu Ala Arg Tyr Phe Ala Ala Val Val Pro
            115   120   125

Phe Leu Asn Ser Met Arg Leu Leu Ile Tyr Gly Leu Arg Leu Tyr Thr
            130   135   140

Asp Glu Ala Leu Val Lys Ser Val Thr Arg Glu Gly Lys Pro Glu Glu
145   150   155   160

Leu Leu Arg Gly Pro Leu Tyr Tyr Val Leu Val Leu Leu Phe Ser Val
            165   170   175

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Leu Val Phe Trp Arg Glu Ser Pro Ile Gly Ile Val Ser Leu Ser Met
            180   185   190

Met Ser Gly Gly Asp Gly Phe Ala Asp Ile Val Gly Arg Arg Tyr Gly
            195   200   205

Ser Ala Lys Leu Pro Phe Asn Arg Lys Lys Ser Trp Ala Gly Ser Ile
            210   215   220

Ser Met Phe Ile Ser Gly Phe Leu Leu Ser Ala Met Met Met Leu Tyr
225   230   235   240

Phe Ser Ser Leu Gly Tyr Ile Asp Val Ile Trp Glu Glu Ala Leu Gly
                245   250   255

Lys Leu Ala Leu Val Ala Leu Ala Ala Thr Val Val Glu Cys Val Pro
            260   265   270

Val Thr Glu Val Val Asp Asp Asn Ile Ser Val Pro Leu Ala Thr Met
            275   280   285

Leu Val Ala Phe Leu Leu Phe Ser Ser Asn Arg Thr Ile Val Asn
            290   295   300

<210> 62
<211> 267
<212> PRT
<213> Zea mays

<400> 62

Met Arg Arg Arg Leu Leu Leu Gly Val Gly Thr Pro Ala Val Ala Ala
1   5   10   15

Leu Ala Ala Ala Ala Pro Pro Ala Val Leu Gln Asp Gly Ala Val Thr
            20   25   30

Val Leu Ile Thr Ala Gly Ala Tyr Ser Leu Val Arg Val Phe Asp Glu
        35   40   45

Leu Thr Glu Arg Arg Leu Ile Glu Lys Ser Leu Ser Arg Lys Val Val
    50   55   60

His Val Leu Ser Gly Val Leu Phe Met Ser Ser Trp Pro Leu Val Ser
65   70   75   80

Asn Ser Thr Glu Ala Arg Tyr Phe Ala Ala Val Val Pro Phe Leu Asn
                85   90   95

Ser Met Arg Leu Leu Ile Tyr Gly Leu Arg Leu Tyr Thr Asp Glu Ala
            100   105   110

Leu Val Lys Ser Val Thr Arg Glu Gly Lys Pro Glu Glu Leu Leu Arg

                115   120   125

Pro Leu Tyr Tyr Val Leu Val Leu Leu Phe Ser Val Leu Val Phe Trp
    130   135   140

Arg Glu Ser Pro Ile Gly Ile Val Ser Leu Ser Met Met Ser Gly Gly
145   150   155   160

Asp Gly Phe Ala Asp Ile Val Gly Arg Arg Tyr Gly Ser Ala Lys Leu
                165   170   175

Pro Phe Asn Arg Lys Lys Ser Trp Ala Gly Ser Ile Ser Met Phe Ile
                180   185   190

Ser Gly Phe Leu Leu Ser Ala Met Met Met Leu Tyr Phe Ser Ser Leu
            195   200   205

Gly Tyr Ile Asp Val Ile Trp Glu Glu Ala Leu Gly Lys Leu Ala Leu
    210   215   220

Val Ala Leu Ala Ala Thr Val Val Glu Cys Val Pro Val Thr Glu Val
225   230   235   240

Val Asp Asp Asn Ile Ser Val Pro Leu Ala Thr Met Leu Val Ala Phe
            245   250   255

Leu Leu Phe Ser Ser Asn Arg Thr Ile Val Asn
            260   265

<210> 63
<211> 236
<212> PRT
<213> Zea mays

<400> 63

Ala Arg Gly Thr Ala Gly Ala Tyr Ser Leu Val Arg Val Phe Asp Glu
1   5   10   15

Leu Thr Glu Arg Arg Leu Ile Glu Lys Ser Leu Ser Arg Lys Val Val
            20   25   30

His Val Leu Ser Gly Val Leu Phe Met Ser Ser Trp Pro Leu Phe Ser
            35   40   45

Asn Ser Thr Glu Ala Arg Tyr Phe Ala Ala Val Val Pro Phe Leu Asn
    50   55   60

Ser Met Arg Leu Leu Ile Tyr Gly Leu Arg Leu Tyr Thr Asp Glu Ala
65   70   75   80

Leu Val Lys Ser Val Thr Arg Glu Gly Lys Pro Glu Glu Leu Leu Arg
            85   90   95

Gly Pro Leu Tyr Tyr Val Leu Val Leu Leu Phe Ser Val Leu Val Phe
            100   105   110

Trp Arg Glu Ser Pro Ile Gly Ile Val Ser Leu Ser Met Met Ser Gly
        115   120   125

Gly Asp Gly Phe Ala Asp Ile Val Gly Arg Arg Tyr Gly Ser Ala Lys
    130   135   140

Leu Pro Phe Asn Arg Lys Lys Ser Trp Ala Gly Ser Ile Ser Met Phe
145   150   155   160

Ile Ser Gly Phe Leu Leu Ser Ala Met Met Met Leu Tyr Phe Ser Ser
            165   170   175

Leu Gly Tyr Ile Asp Val Ile Trp Glu Glu Ala Leu Gly Lys Leu Ala
            180   185   190

Leu Val Ala Leu Ala Ala Thr Val Val Glu Cys Val Pro Val Thr Glu
            195   200   205

Val Val Asp Asp Asn Ile Ser Val Pro Leu Ala Thr Met Leu Val Ala
    210   215   220

Phe Leu Leu Phe Ser Ser Asn Arg Thr Ile Val Asn
225   230   235

<210> 64
<211> 302
<212> PRT
<213> Zea mays

<400> 64

Leu Ser Tyr Ser Thr His Arg Ala His Leu Leu Gln Ser Arg Pro Leu
1   5   10   15

Ser Pro Ser Pro Thr Val Pro Ala Gly Ala Ala Ser Ala Ser Cys Ala
            20   25   30

Pro Arg Ser Leu Cys Phe Arg Arg Arg Arg Ser Ser Arg Leu Ala Ala
        35   40   45

Glu Arg Thr Arg Arg Pro Thr Met Ala Ala Ala Ile Ser Leu Glu Ala
    50   55   60

Gly Gly Ala Leu Ala His Asp Leu Gly Ser Ala Val Val Thr Gly Gly
65   70   75   80

Val Ala Leu Ala Leu Leu Lys Phe Phe Glu Glu Leu Ala Lys Arg Gly
            85   90   95

```
Val Phe Glu Gln Lys Leu Ser Arg Lys Leu Val His Ile Ser Val Gly
            100             105             110

Leu Val Phe Met Leu Phe Trp Pro Leu Phe Ser Ser Gly Trp Tyr Thr
            115             120             125

Pro Phe Leu Ala Ala Leu Ala Pro Gly Val Asn Ile Ile Arg Met Leu
    130             135             140

Leu Leu Gly Leu Gly Leu Met Lys Asn Glu Ala Met Val Lys Ser Met
145             150             155             160

Ser Arg Ser Gly Asp Tyr Arg Glu Leu Leu Lys Gly Pro Leu Tyr Tyr
                165             170             175

Ala Ala Thr Ile Thr Phe Ala Thr Ser Leu Leu Trp Arg Thr Ser Pro
            180             185             190

Val Ala Ile Ala Leu Ile Cys Asn Leu Cys Ala Gly Asp Gly Ile Ala
            195             200             205

Asp Val Val Gly Arg Arg Leu Gly Lys Glu Lys Leu Pro Tyr Asn Pro
    210             215             220

Asn Lys Ser Tyr Ala Gly Ser Ile Ala Met Ala Val Ala Gly Phe Leu
225             230             235             240

Ala Ser Val Gly Tyr Met His Tyr Phe His Thr Phe Gly Phe Ile Glu
                245             250             255

Glu Thr Trp Tyr Met Ala Leu Ser Phe Leu Val Val Ser Val Ala Ala
            260             265             270

Ala Leu Val Glu Ser His Pro Ile Ser Thr Glu Leu Asp Asp Asn Leu
    275             280             285

Thr Val Leu Leu Thr Ser Phe Leu Val Gly Ser Leu Ile Phe
    290             295             300
```

```
<210>  65
<211>  312
<212>  PRT
<213>  Zea mays

<400>  65
```

```
Met Leu Ser Leu Ala Ala His Ile Thr Pro Leu Ser Tyr Ser Thr His
1               5               10              15

Arg Ala His Leu Leu Gln Ser Arg Pro Leu Ser Pro Ser Pro Thr Val
            20              25              30
```

Pro Ala Gly Ala Ala Ser Ala Ser Cys Ala Pro Arg Ser Leu Cys Phe
    35   40   45

Arg Arg Arg Arg Ser Ser Arg Leu Ala Ala Glu Arg Thr Arg Arg Pro
    50   55   60

Thr Met Ala Ala Ala Ile Ser Leu Glu Ala Gly Gly Ala Leu Ala His
65   70   75   80

Asp Leu Gly Ser Ala Val Val Thr Gly Gly Val Ala Leu Ala Leu Leu
         85   90   95

Lys Phe Phe Glu Glu Leu Ala Lys Arg Gly Val Phe Glu Gln Lys Leu
      100   105   110

Ser Arg Lys Leu Val His Ile Ser Val Gly Leu Val Phe Met Leu Phe
    115   120   125

Trp Pro Leu Phe Ser Ser Gly Trp Tyr Thr Pro Phe Leu Ala Ala Leu
    130   135   140

Ala Pro Gly Val Asn Ile Ile Arg Met Leu Leu Leu Gly Leu Gly Leu
145   150   155   160

Met Lys Asn Glu Ala Met Val Lys Ser Met Ser Arg Ser Gly Asp Tyr
      165   170   175

Arg Glu Leu Leu Lys Gly Pro Leu Tyr Tyr Ala Ala Thr Ile Thr Phe
      180   185   190

Ala Thr Ser Leu Leu Trp Arg Thr Ser Pro Val Ala Ile Ala Leu Ile
    195   200   205

Cys Asn Leu Cys Ala Gly Asp Gly Ile Ala Asp Val Val Gly Arg Arg
    210   215   220

Leu Gly Lys Glu Lys Leu Pro Tyr Asn Pro Asn Lys Ser Tyr Ala Gly
225   230   235   240

Ser Ile Ala Met Ala Val Ala Gly Phe Leu Ala Ser Val Gly Tyr Met
      245   250   255

His Tyr Phe His Thr Phe Gly Phe Ile Glu Glu Thr Trp Tyr Met Ala
      260   265   270

Leu Ser Phe Leu Val Val Ser Val Ala Ala Ala Leu Val Glu Ser His
    275   280   285

Pro Ile Ser Thr Glu Leu Asp Asp Asn Leu Thr Val Pro Leu Thr Ser
    290   295   300

Phe Leu Val Gly Ser Leu Ile Phe
305   310

<210> 66
<211> 307
<212> PRT
<213> Zea mays

<400> 66

Met Ala Thr Thr Ser Thr Thr Thr Lys Leu Ser Val Leu Cys Cys Ser
1   5   10   15

Phe Ile Ser Ser Pro Leu Val Asp Ser Pro Pro Ser Leu Ala Phe Phe
            20   25   30

Ser Pro Ile Pro Arg Phe Leu Thr Val Arg Ile Ala Thr Ser Phe Arg
            35   40   45

Ser Ser Ser Arg Phe Pro Ala Thr Lys Ile Arg Lys Ser Ser Leu Ala
            50   55   60

Ala Val Met Phe Pro Glu Asn Ser Val Leu Ser Asp Val Cys Ala Phe
65   70   75   80

Gly Val Thr Ser Ile Val Ala Phe Ser Cys Leu Gly Phe Trp Gly Glu
                85   90   95

Ile Gly Lys Arg Gly Ile Phe Asp Gln Lys Leu Ile Arg Lys Leu Val
            100   105   110

His Ile Asn Ile Gly Leu Val Phe Met Leu Cys Trp Pro Leu Phe Ser
            115   120   125

Ser Gly Ile Gln Gly Ala Leu Phe Ala Ser Leu Val Pro Gly Leu Asn
            130   135   140

Ile Val Arg Met Leu Leu Leu Gly Leu Gly Val Tyr His Asp Glu Gly
145   150   155   160

Thr Ile Lys Ser Met Ser Arg His Gly Asp Arg Arg Glu Leu Leu Lys
                165   170   175

Gly Pro Leu Tyr Tyr Val Leu Ser Ile Thr Ser Ala Cys Ile Tyr Tyr
            180   185   190

Trp Lys Ser Ser Pro Ile Ala Ile Ala Val Ile Cys Asn Leu Cys Ala
            195   200   205

Gly Asp Gly Met Ala Asp Ile Val Gly Arg Arg Phe Gly Thr Glu Lys
            210   215   220

Leu Pro Tyr Asn Lys Asn Lys Ser Phe Ala Gly Ser Ile Gly Met Ala

225   230   235   240

Thr Ala Gly Phe Leu Ala Ser Val Gly Tyr Met Tyr Tyr Phe Ala Ser
            245   250   255

Phe Gly Tyr Ile Glu Asp Ser Gly Gly Met Ile Leu Arg Phe Leu Val
            260   265   270

Ile Ser Ile Ala Ser Ala Leu Val Glu Ser Leu Pro Ile Ser Thr Asp
        275   280   285

Ile Asp Asp Asn Leu Thr Ile Ser Leu Thr Ser Ala Leu Ala Gly Phe
    290   295   300

Leu Leu Phe
305

<210>   67
<211>   298
<212>   PRT
<213>   Zea mays

<400>   67

Arg Thr Ala Glu Leu Gln His Pro Val Gln Gln Gln Asp Gln Arg Gly
1   5   10   15

Cys Thr Ser Ala Ser Arg Val Gly Thr Met Trp Thr Gly Ser Pro Leu
            20   25   30

Leu Arg Asp Val Gly Ala Ala Val Leu Thr Gly Val Ala Ala Ala Ala
            35   40   45

Val Leu Arg Phe Trp Glu Glu Ile Ala Asn Arg Ala Leu Leu Asp Gln
    50   55   60

Lys Leu Cys Arg Lys Leu Val His Ile Thr Val Gly Leu Val Phe Phe
65   70   75   80

Leu Met Trp Pro Leu Phe Ser Ser Asp Asp Val Phe Ala Pro Ser Leu
            85   90   95

Ala Pro Leu Ile Ile Ile Ile Asn Ile Met Lys Val Thr Val Ile Gly
            100   105   110

Leu Gly Phe Val Lys Ala Glu Gly Val Val Asn Ser Met Thr Arg His
            115   120   125

Gly Asp Arg Arg Glu Leu Leu Lys Gly Pro Leu Tyr Tyr Ala Cys Ala
    130   135   140

Ile Thr Leu Thr Thr Ile Val Phe Trp Arg Thr Ser Pro Ile Ser Ile
145   150   155   160

Ala Val Ile Cys Asn Leu Cys Ala Gly Asp Gly Val Ala Asp Ile Ala
                165   170   175

Gly Arg Arg Phe Gly His Val Lys Leu Pro His Asn Pro Glu Lys Ser
            180   185   190

Tyr Ala Gly Ser Ile Ala Met Phe Leu Ala Gly Phe Ile Ala Ser Val
            195   200   205

Leu Phe Met Cys Tyr Phe Asn Ile Phe Gly Phe Val Glu Lys Ser Trp
    210   215   220

Ser Met Val Ala Ala Phe Gly Val Ile Ser Leu Ala Ala Ala Val Val
225   230   235   240

Glu Ser Leu Pro Ile Ser Thr Arg Leu Asp Asp Asn Leu Thr Val Ser
            245   250   255

Val Ala Ser Val Leu Val Gly Ala Leu Val Phe Tyr Ser Ile Gly Ala
            260   265   270

Arg Asn Leu Cys Cys Met Ser Ser Glu Val Arg Arg Ser Ile Pro Ala
    275   280   285

Thr Val Gly Met Val Phe Ala Gly Ser Ser
    290   295

<210> 68
<211> 166
<212> PRT
<213> Sorghum bicolor

<400> 68

Met Phe Ser Leu Gly Pro Leu Gly Ala His Thr Ser Pro Leu Ser Cys
1   5   10   15

Ser Thr Tyr His Ala Pro Leu Leu Gln Ser Arg Arg Leu Ser Pro Ser
            20   25   30

Pro Thr Ala Pro Ala Ser Ala Ala Ala Ala Ser Cys Ala Pro Arg Ser
            35   40   45

Leu Cys Phe Leu Arg Arg Arg Ser Ser Arg Phe Ala Ala Glu Arg Asn
    50   55   60

Arg Arg Pro Thr Met Ala Ala Ala Ile Ser Leu Glu Ala Gly Gly Gly
65   70   75   80

Leu Ala His Asp Leu Gly Ser Ala Ala Val Thr Ala Gly Val Ala Leu
            85   90   95

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```
Ala Leu Leu Lys Phe Phe Glu Glu Ile Ala Lys Arg Gly Val Phe Glu
            100             105             110


Gln Lys Leu Ser Arg Lys Leu Val His Ile Ser Val Gly Leu Val Phe
            115             120             125


Leu Leu Phe Trp Pro Leu Phe Ser Ser Gly Trp Tyr Ala Pro Phe Leu
            130             135             140


Ala Ala Leu Ala Pro Gly Val Asn Val Ile Arg Met Leu Leu Leu Gly
145             150             155             160


Leu Gly Leu Met Lys Asn
                165



<210>  69
<211>  24
<212>  PRT
<213>  Artificial - CY Motif 1

<220>
<223>  Conserved Motif


<220>
<221>  MISC_FEATURE
<222>  (1)..(1)
<223>  x = e or d

<220>
<221>  MISC_FEATURE
<222>  (2)..(2)
<223>  x = v, l, i, or w

<220>
<221>  MISC_FEATURE
<222>  (3)..(3)
<223>  x = t, v, or s

<220>
<221>  MISC_FEATURE
<222>  (6)..(6)
<223>  x = i, a, or v

<220>
<221>  MISC_FEATURE
<222>  (7)..(7)
<223>  x = v or i

<220>
<221>  MISC_FEATURE
<222>  (9)..(9)
<223>  x = i or m

<220>
<221>  MISC_FEATURE
<222>  (11)..(11)
<223>  x = a, t, or s

<220>
<221>  MISC_FEATURE
<222>  (13)..(13)
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```
<223>  x = q, m, n, h, p, or a

<220>
<221>  MISC_FEATURE
<222>  (14)..(14)
<223>  x = v, w, or i

<220>
<221>  MISC_FEATURE
<222>  (15)..(15)
<223>  x = v or i

<220>
<221>  MISC_FEATURE
<222>  (16)..(16)
<223>  x = l, f, or p

<220>
<221>  MISC_FEATURE
<222>  (17)..(17)
<223>  x = i, g, l, or f

<220>
<221>  MISC_FEATURE
<222>  (18)..(18)
<223>  x = a or v

<220>
<221>  MISC_FEATURE
<222>  (19)..(19)
<223>  x = w, l, or y

<220>
<221>  MISC_FEATURE
<222>  (20)..(20)
<223>  x = w, l, a, or f

<220>
<221>  MISC_FEATURE
<222>  (21)..(21)
<223>  x = l or f

<220>
<221>  MISC_FEATURE
<222>  (22)..(22)
<223>  x = s, f, d, e, g, a, or n

<220>
<221>  MISC_FEATURE
<222>  (23)..(23)
<223>  x = i, n, or v

<220>
<221>  MISC_FEATURE
<222>  (24)..(24)
<223>  x = p, r, or s

<400>  69

Xaa Xaa Xaa Arg Lys Xaa Xaa His Xaa Gly Xaa Gly Xaa Xaa Xaa Xaa
1               5                   10                  15


Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
            20


<210>  70
```

```
<211>  30
<212>  PRT
<213>  Artificial - CY Motif 2

<220>
<223>  Conserved Motif


<220>
<221>  MISC_FEATURE
<222>  (1)..(1)
<223>  x = i, f, or l

<220>
<221>  MISC_FEATURE
<222>  (2)..(2)
<223>  x = l, i, f, or v

<220>
<221>  MISC_FEATURE
<222>  (3)..(3)
<223>  x = p, g, or t

<220>
<221>  MISC_FEATURE
<222>  (4)..(4)
<223>  x = s, a, or g

<220>
<221>  MISC_FEATURE
<222>  (5)..(5)
<223>  x = l, m, i, or v

<220>
<221>  MISC_FEATURE
<222>  (6)..(6)
<223>  x = e, d, n, or s

<220>
<221>  MISC_FEATURE
<222>  (7)..(7)
<223>  x = s, t, g, d, or n

<220>
<221>  MISC_FEATURE
<222>  (8)..(8)
<223>  x = v, q, or i

<220>
<221>  MISC_FEATURE
<222>  (9)..(9)
<223>  x = g, d, n, or e

<220>
<221>  MISC_FEATURE
<222>  (10)..(10)
<223>  x = r or s

<220>
<221>  MISC_FEATURE
<222>  (11)..(11)
<223>  x = h, s, q, k, or n

<220>
<221>  MISC_FEATURE
<222>  (12)..(12)
<223>  x = s or none
```

```
<220>
<221>  MISC_FEATURE
<222>  (13)..(13)
<223>  x = y, p, f, l, or w

<220>
<221>  MISC_FEATURE
<222>  (16)..(16)
<223>  x = l, v, f, or i

<220>
<221>  MISC_FEATURE
<222>  (17)..(17)
<223>  x = f, y, or a

<220>
<221>  MISC_FEATURE
<222>  (18)..(18)
<223>  x = y or f

<220>
<221>  MISC_FEATURE
<222>  (19)..(19)
<223>  x = a, s, or g

<220>
<221>  MISC_FEATURE
<222>  (20)..(20)
<223>  x = l, i, or v

<220>
<221>  MISC_FEATURE
<222>  (21)..(21)
<223>  x = s, t, or a

<220>
<221>  MISC_FEATURE
<222>  (22)..(22)
<223>  x = i, v, or f

<220>
<221>  MISC_FEATURE
<222>  (23)..(23)
<223>  x = g or t

<220>
<221>  MISC_FEATURE
<222>  (24)..(24)
<223>  x = l, i, or m

<220>
<221>  MISC_FEATURE
<222>  (26)..(26)
<223>  x = v, f, i, m, or l

<220>
<221>  MISC_FEATURE
<222>  (27)..(27)
<223>  x = g, a, or i

<220>
<221>  MISC_FEATURE
<222>  (28)..(28)
<223>  x = g, l, s, w, or f

<220>
<221>  MISC_FEATURE
<222>  (29)..(29)
```

```
<223>   x = f, l, or c

<220>
<221>   MISC_FEATURE
<222>   (30)..(30)
<223>   x = f or w

<400>   70
```

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Gly Thr Xaa
1   5   10   15

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Leu Xaa Xaa Xaa Xaa Xaa
            20   25   30

```
<210>   71
<211>   16
<212>   PRT
<213>   Artificial CY Motif 3

<220>
<223>   Conserved Motif


<220>
<221>   MISC_FEATURE
<222>   (2)..(2)
<223>   x = i, m, or v

<220>
<221>   MISC_FEATURE
<222>   (3)..(3)
<223>   x = l or m

<220>
<221>   MISC_FEATURE
<222>   (4)..(4)
<223>   x = v, a, i, or t

<220>
<221>   MISC_FEATURE
<222>   (6)..(6)
<223>   x = a or t

<220>
<221>   MISC_FEATURE
<222>   (7)..(7)
<223>   x = w, f, or l

<220>
<221>   MISC_FEATURE
<222>   (10)..(10)
<223>   x = g or a

<220>
<221>   MISC_FEATURE
<222>   (11)..(11)
<223>   x = l or f

<220>
<221>   MISC_FEATURE
<222>   (13)..(13)
<223>   x = a or g

<220>
<221>   MISC_FEATURE
```

```
<222>  (14)..(14)
<223>  x = l, f, or i

<220>
<221>  MISC_FEATURE
<222>  (15)..(15)
<223>  x = v or i

<400>  71

Gly Xaa Xaa Xaa Met Xaa Xaa Gly Asp Xaa Xaa Ala Xaa Xaa Xaa Gly
1               5                   10              15


<210>  72
<211>  19
<212>  PRT
<213>  Artificial - CY Motif 4

<220>
<223>  Conserved Motif


<220>
<221>  MISC_FEATURE
<222>  (1)..(1)
<223>  x = g or n

<220>
<221>  MISC_FEATURE
<222>  (2)..(2)
<223>  x = f, s, t, a, m, or q

<220>
<221>  MISC_FEATURE
<222>  (3)..(3)
<223>  x = r, v, q, n, s, or t

<220>
<221>  MISC_FEATURE
<222>  (4)..(4)
<223>  x = k or r

<220>
<221>  MISC_FEATURE
<222>  (6)..(6)
<223>  x = w, i, v, or l

<220>
<221>  MISC_FEATURE
<222>  (7)..(7)
<223>  x = e, a, or i

<220>
<221>  MISC_FEATURE
<222>  (9)..(9)
<223>  x = t or s

<220>
<221>  MISC_FEATURE
<222>  (10)..(10)
<223>  x = l or a

<220>
<221>  MISC_FEATURE
<222>  (11)..(11)
<223>  x = t, a, or g
```

```
<220>
<221>   MISC_FEATURE
<222>   (13)..(13)
<223>   x = v, f, m, a, c, or g

<220>
<221>   MISC_FEATURE
<222>   (14)..(14)
<223>   x = l, v, f, or w

<220>
<221>   MISC_FEATURE
<222>   (15)..(15)
<223>   x = a, v, or i

<220>
<221>   MISC_FEATURE
<222>   (16)..(16)
<223>   x = s or t

<220>
<221>   MISC_FEATURE
<222>   (17)..(17)
<223>   x = f, t, y, l, or a

<220>
<221>   MISC_FEATURE
<222>   (18)..(18)
<223>   x = l, v, f, t, or i

<220>
<221>   MISC_FEATURE
<222>   (19)..(19)
<223>   x = v or i

<400>   72

Xaa Xaa Xaa Xaa Ser Xaa Xaa Gly Xaa Xaa Xaa Met Xaa Xaa Xaa Xaa
1               5                   10                  15


Xaa Xaa Xaa


<210>   73
<211>   17
<212>   PRT
<213>   Artificial - CY Motif 5

<220>
<223>   Conserved Motif


<220>
<221>   MISC_FEATURE
<222>   (1)..(1)
<223>   x = l or a

<220>
<221>   MISC_FEATURE
<222>   (3)..(3)
<223>   x = s, a, t, l, or q

<220>
<221>   MISC_FEATURE
<222>   (4)..(4)
<223>   x = f, v, l, or i
```

```
<220>
<221>  MISC_FEATURE
<222>  (5)..(5)
<223>  x = s or a

<220>
<221>  MISC_FEATURE
<222>  (6)..(6)
<223>  x = r, p, f, l, k, w, or t

<220>
<221>  MISC_FEATURE
<222>  (7)..(7)
<223>  x = w, h, l, v, r, or a

<220>
<221>  MISC_FEATURE
<222>  (9)..(9)
<223>  x = i, t, v, l, or m

<220>
<221>  MISC_FEATURE
<222>  (12)..(12)
<223>  x = l or i

<220>
<221>  MISC_FEATURE
<222>  (13)..(13)
<223>  x = t or s

<220>
<221>  MISC_FEATURE
<222>  (16)..(16)
<223>  x = l or i

<220>
<221>  MISC_FEATURE
<222>  (17)..(17)
<223>  x = g, v, or l

<400>  73

Xaa Glu Xaa Xaa Xaa Xaa Xaa Gly Xaa Asp Asn Xaa Xaa Val Pro Xaa
1                   5                   10                  15


Xaa



<210>  74
<211>  22
<212>  PRT
<213>  Artificial - PL Motif 1

<220>
<223>  Conserved Motif


<220>
<221>  MISC_FEATURE
<222>  (2)..(2)
<223>  x = s, i, n, or c

<220>
<221>  MISC_FEATURE
<222>  (5)..(5)
```

```
<223>  x = l, v, or i

<220>
<221>  MISC_FEATURE
<222>  (8)..(8)
<223>  x = i or v

<220>
<221>  MISC_FEATURE
<222>  (9)..(9)
<223>  x = l, n, s, or t

<220>
<221>  MISC_FEATURE
<222>  (10)..(10)
<223>  x = s, i, or v

<220>
<221>  MISC_FEATURE
<222>  (12)..(12)
<223>  x = l, m, or v

<220>
<221>  MISC_FEATURE
<222>  (13)..(13)
<223>  x = l, v, i, or f

<220>
<221>  MISC_FEATURE
<222>  (14)..(14)
<223>  x = f or y

<220>
<221>  MISC_FEATURE
<222>  (15)..(15)
<223>  x = v, m, l, f, or a

<220>
<221>  MISC_FEATURE
<222>  (16)..(16)
<223>  x = l, i, v, s, or a

<220>
<221>  MISC_FEATURE
<222>  (17)..(17)
<223>  Xaa can be any naturally occurring amino acid

<220>
<221>  MISC_FEATURE
<222>  (18)..(18)
<223>  x = w or none

<220>
<221>  MISC_FEATURE
<222>  (20)..(20)
<223>  x = i or l

<220>
<221>  MISC_FEATURE
<222>  (21)..(21)
<223>  x = f or v

<400>  74

Leu Xaa Arg Lys Xaa Val His Xaa Xaa Xaa Gly Xaa Xaa Xaa Xaa Xaa
1               5                   10                  15
```

Xaa Xaa Pro Xaa Xaa Ser
            20

```
<210>  75
<211>  45
<212>  PRT
<213>  Artificial - PL Motif 2

<220>
<223>  Conserved Motif


<220>
<221>  MISC_FEATURE
<222>  (2)..(2)
<223>  x = a, s, or p

<220>
<221>  MISC_FEATURE
<222>  (3)..(3)
<223>  x = f, l, v, or i

<220>
<221>  MISC_FEATURE
<222>  (4)..(4)
<223>  x = v, a, t, or i

<220>
<221>  MISC_FEATURE
<222>  (5)..(5)
<223>  x = p or i

<220>
<221>  MISC_FEATURE
<222>  (6)..(6)
<223>  x = l, g, a, i, or f

<220>
<221>  misc_feature
<222>  (7)..(7)
<223>  x = v, l, i, or f

<220>
<221>  misc_feature
<222>  (9)..(9)
<223>  x = g, i, v, c, or s

<220>
<221>  misc_feature
<222>  (10)..(10)
<223>  x = l, v, i, f, or m

<220>
<221>  misc_feature
<222>  (11)..(11)
<223>  x = r or k

<220>
<221>  misc_feature
<222>  (12)..(12)
<223>  x = l, m, or v

<220>
<221>  misc_feature
<222>  (13)..(13)
<223>  x = v, l, t, or i
```

```
<220>
<221>  misc_feature
<222>  (14)..(14)
<223>  x = i, l, f, v, or t

<220>
<221>  misc_feature
<222>  (15)..(15)
<223>  x = n, l, m, i, h, or y

<220>
<221>  misc_feature
<222>  (17)..(17)
<223>  x = l or s

<220>
<221>  misc_feature
<222>  (18)..(18)
<223>  x = s, g, or r

<220>
<221>  misc_feature
<222>  (19)..(19)
<223>  x = i, v, l, or f

<220>
<221>  misc_feature
<222>  (20)..(20)
<223>  x = s, y, m, i, w, l, v, t, or a

<220>
<221>  misc_feature
<222>  (21)..(21)
<223>  x = p, h, k, q, d, s, or t

<220>
<221>  misc_feature
<222>  (22)..(22)
<223>  x = n, d, or a

<220>
<221>  misc_feature
<222>  (23)..(23)
<223>  x = s, e, d, or q

<220>
<221>  misc_feature
<222>  (24)..(24)
<223>  x = m, g, a, t, or s

<220>
<221>  misc_feature
<222>  (25)..(25)
<223>  x = l, t, m, or v

<220>
<221>  misc_feature
<222>  (26)..(26)
<223>  x = i or v

<220>
<221>  misc_feature
<222>  (27)..(27)
<223>  x = k, q, or n

<220>
<221>  misc_feature
<222>  (29)..(29)
```

```
<223>   x = v, m, or i

<220>
<221>   misc_feature
<222>   (30)..(30)
<223>   x = t or s

<220>
<221>   misc_feature
<222>   (32)..(32)
<223>   x = e, h, s, y, f, or n

<220>
<221>   misc_feature
<222>   (34)..(34)
<223>   x = r, d, n, or k

<220>
<221>   misc_feature
<222>   (35)..(35)
<223>   x = a, r, y, h, or p

<220>
<221>   misc_feature
<222>   (36)..(36)
<223>   x = e, r, k, or l

<220>
<221>   misc_feature
<222>   (40)..(40)
<223>   x = k or r

<220>
<221>   misc_feature
<222>   (41)..(41)
<223>   x = g or none

<220>
<221>   misc_feature
<222>   (44)..(44)
<223>   x = f or y

<400>   75

Ala Xaa Xaa Xaa Xaa Xaa Xaa Asn Xaa Xaa Xaa Xaa Xaa Xaa Xaa Gly
1               5                   10                  15


Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Ser Xaa Xaa Arg Xaa
            20                  25                  30


Gly Xaa Xaa Xaa Glu Leu Leu Xaa Gly Pro Leu Xaa Tyr
        35                  40                  45


<210>   76
<211>   36
<212>   PRT
<213>   Artificial - PL Motif 3

<220>
<223>   Conserved Motif


<220>
<221>   MISC_FEATURE
<222>   (2)..(2)
```

<223>   x = r or k

<220>
<221>   MISC_FEATURE
<222>   (3)..(3)
<223>   x = e, s, t, d, or q

<220>
<221>   MISC_FEATURE
<222>   (6)..(6)
<223>   x = i, v, or t

<220>
<221>   MISC_FEATURE
<222>   (7)..(7)
<223>   x = g, a, or s

<220>
<221>   MISC_FEATURE
<222>   (8)..(8)
<223>   x = m, i, or v

<220>
<221>   MISC_FEATURE
<222>   (9)..(9)
<223>   x = i, a, or v

<220>
<221>   MISC_FEATURE
<222>   (10)..(10)
<223>   x = s, v, l, a, or c

<220>
<221>   MISC_FEATURE
<222>   (11)..(11)
<223>   x = l, i, or v

<220>
<221>   MISC_FEATURE
<222>   (12)..(12)
<223>   x = a, c, or s

<220>
<221>   MISC_FEATURE
<222>   (13)..(13)
<223>   x = m or n

<220>
<221>   MISC_FEATURE
<222>   (14)..(14)
<223>   x = m or l

<220>
<221>   MISC_FEATURE
<222>   (15)..(15)
<223>   x = c or s

<220>
<221>   MISC_FEATURE
<222>   (16)..(16)
<223>   x = g or a

<220>
<221>   MISC_FEATURE
<222>   (20)..(20)
<223>   x = i, m, l, v, or f

<220>

```
<221>  MISC_FEATURE
<222>  (23)..(23)
<223>  x = i or v

<220>
<221>  MISC_FEATURE
<222>  (24)..(24)
<223>  x = m, v, i, or a

<220>
<221>  MISC_FEATURE
<222>  (27)..(27)
<223>  x = k, r, or q

<220>
<221>  MISC_FEATURE
<222>  (28)..(28)
<223>  x = f, l, or y

<220>
<221>  MISC_FEATURE
<222>  (30)..(30)
<223>  x = s, t, k, q, r, g, or h

<220>
<221>  MISC_FEATURE
<222>  (31)..(31)
<223>  x = t, e, h, k, i, v, y, s, m, a, or l

<220>
<221>  MISC_FEATURE
<222>  (33)..(33)
<223>  x = i or l

<220>
<221>  MISC_FEATURE
<222>  (34)..(34)
<223>  x = p or t

<220>
<221>  MISC_FEATURE
<222>  (35)..(35)
<223>  x = y, h, or f

<400>  76

Trp Xaa Xaa Ser Pro Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
1               5                   10                  15


Gly Asp Gly Xaa Ala Asp Xaa Xaa Gly Arg Xaa Xaa Gly Xaa Xaa Lys
            20                  25                  30


Xaa Xaa Xaa Asn
        35


<210>  77
<211>  30
<212>  PRT
<213>  Artificial - PL Motif 4

<220>
<223>  Conserved Motif


<220>
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```
<221>  MISC_FEATURE
<222>  (3)..(3)
<223>  x = w, f, y, i, l, or v

<220>
<221>  MISC_FEATURE
<222>  (4)..(4)
<223>  x = a, e, v, or i

<220>
<221>  MISC_FEATURE
<222>  (7)..(7)
<223>  x = i, a, v, or m

<220>
<221>  MISC_FEATURE
<222>  (8)..(8)
<223>  x = s, g, or a

<220>
<221>  MISC_FEATURE
<222>  (10)..(10)
<223>  x = f, a, or l

<220>
<221>  MISC_FEATURE
<222>  (11)..(11)
<223>  x = i, t, v, l, or f

<220>
<221>  MISC_FEATURE
<222>  (12)..(12)
<223>  x = f, a, or s

<220>
<221>  MISC_FEATURE
<222>  (15)..(15)
<223>  x = f, l, m, v, or i

<220>
<221>  MISC_FEATURE
<222>  (16)..(16)
<223>  x = i, a, s, t, v, or l

<220>
<221>  MISC_FEATURE
<222>  (18)..(18)
<223>  x = i, v, or a

<220>
<221>  MISC_FEATURE
<222>  (19)..(19)
<223>  x = a, g, l, or m

<220>
<221>  MISC_FEATURE
<222>  (20)..(20)
<223>  x = l, y, f, or m

<220>
<221>  MISC_FEATURE
<222>  (21)..(21)
<223>  x = l or m

<220>
<221>  MISC_FEATURE
<222>  (22)..(22)
<223>  x = y, h, w, c, l, f, or s
```

```
<220>
<221>  MISC_FEATURE
<222>  (24)..(24)
<223>  x = y or f

<220>
<221>  MISC_FEATURE
<222>  (25)..(25)
<223>  x = s, a, h, q, or n

<220>
<221>  MISC_FEATURE
<222>  (26)..(26)
<223>  x = s, t, i, y, l, a, v, c, or w

<220>
<221>  MISC_FEATURE
<222>  (27)..(27)
<223>  x = l or f

<220>
<221>  MISC_FEATURE
<222>  (29)..(29)
<223>  x = y, f, l, or h

<220>
<221>  MISC_FEATURE
<222>  (30)..(30)
<223>  x = l, i, m, v, or f

<400>  77

Lys Ser Xaa Xaa Gly Ser Xaa Xaa Met Xaa Xaa Xaa Gly Phe Xaa Xaa
1               5                   10                  15


Ser Xaa Xaa Xaa Xaa Xaa Tyr Xaa Xaa Xaa Xaa Gly Xaa Xaa
            20                  25                  30


<210>  78
<211>  19
<212>  PRT
<213>  Artificial - PL Motif 5

<220>
<223>  Conserved Motif


<220>
<221>  MISC_FEATURE
<222>  (1)..(1)
<223>  x = m, v, l, i, or f

<220>
<221>  MISC_FEATURE
<222>  (2)..(2)
<223>  x = v, i, l, or t

<220>
<221>  MISC_FEATURE
<222>  (3)..(3)
<223>  x = s or a

<220>
<221>  MISC_FEATURE
<222>  (4)..(4)
```

```
<223>   x = m, i, v, f, or l

<220>
<221>   MISC_FEATURE
<222>   (5)..(5)
<223>   x = v, a, t, or s

<220>
<221>   MISC_FEATURE
<222>   (6)..(6)
<223>   x = a, s, or t

<220>
<221>   MISC_FEATURE
<222>   (7)..(7)
<223>   x = t or a

<220>
<221>   MISC_FEATURE
<222>   (8)..(8)
<223>   x = v, l, f, or i

<220>
<221>   MISC_FEATURE
<222>   (9)..(9)
<223>   x = v or i

<220>
<221>   MISC_FEATURE
<222>   (11)..(11)
<223>   x = s or c

<220>
<221>   MISC_FEATURE
<222>   (12)..(12)
<223>   x = l, h, v, or i

<220>
<221>   MISC_FEATURE
<222>   (14)..(14)
<223>   x = i or v

<220>
<221>   MISC_FEATURE
<222>   (15)..(15)
<223>   x = t, s, or n

<220>
<221>   MISC_FEATURE
<222>   (16)..(16)
<223>   x = d, t, s, m, k, or e

<220>
<221>   MISC_FEATURE
<222>   (17)..(17)
<223>   x = q, d, e, h, r, l, or v

<220>
<221>   MISC_FEATURE
<222>   (18)..(18)
<223>   x = l, i, or v

<400>   78

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Glu Xaa Xaa Pro Xaa Xaa Xaa
1                   5                   10                  15
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Xaa Xaa Asp

<210> 79
<211> 233
<212> PRT
<213> Synechococcus sp.

<400> 79

Met Gly Ile Glu Gln Asn Asn Pro Met Ala Leu Pro Leu Trp Ile Ala
1   5   10   15

Val Gly Leu Ala Ala Thr Tyr Leu Gly Ala Val Val Leu Thr Ala Glu
            20   25   30

Leu Leu Asn Arg Leu Ser Leu Ser Pro Ala Glu Val Thr Arg Lys Ile
        35   40   45

Val His Ile Gly Ala Gly Gln Val Val Leu Ile Ala Trp Trp Leu Ser
    50   55   60

Ile Pro Gly Trp Val Gly Ala Ile Ala Gly Val Phe Ala Ala Gly Ile
65   70   75   80

Ala Val Leu Ser Tyr Arg Leu Pro Ile Leu Pro Ser Leu Glu Ser Val
                85   90   95

Gly Arg His Ser Tyr Gly Thr Leu Phe Tyr Ala Leu Ser Ile Gly Leu
                100   105   110

Leu Val Gly Gly Phe Phe Ser Leu Gly Leu Pro Ile Phe Ala Ala Ile
            115   120   125

Gly Ile Leu Val Met Ala Trp Gly Asp Gly Leu Ala Ala Leu Val Gly
        130   135   140

Gln Arg Trp Gly Arg His Arg Tyr Gln Val Phe Gly Phe Arg Lys Ser
145   150   155   160

Trp Glu Gly Thr Leu Thr Met Val Leu Ala Ser Phe Leu Val Thr Val
                165   170   175

Val Phe Leu Ser Tyr Thr Phe Gly Phe Thr Val Ile Val Leu Val Val
            180   185   190

Ala Gly Thr Val Ala Ile Ala Ser Ala Gly Leu Glu Ser Phe Ser Arg
        195   200   205

Trp Gly Ile Asp Asn Leu Thr Val Pro Leu Gly Ser Ala Leu Ile Ala
    210   215   220

Trp Ala Gly Ser Tyr Leu Trp Leu Gly
                    Page 87

225   230